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Fleet Capacity and Financial Health Canadian Level I Airlines

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FLEET CAPACITY AND FINANCIAL HEALTH

CANADIAN LEVEL I AIRLINES

Canadian Transport Commission

Research Branch

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Foreword

In 1981 the Air Transport Committee and the Research Branch of the Canadian Transport Commission undertook on a joint basis a programme of studies concerning airline pricing and financial performance. This programme resulted in the publication of four working papers during 1982. This paper presents current data on the topic, and interprets them and the 1982 studies in the context of the financial and regulatory circumstances faced by the airlines as of July 1984.

The underlying data were assembled by J. Serafin, assisted by B. Bell. The paper was written by R. Lake and A. Mozes.

Some aspects of this paper will doubtless prove controversial. It is released for discussion by the Research Branch in its role of disseminator of data and analysis it believes will enhance understanding of the Canadian transportation sector. Nevertheless, the views expressed are not necessarily those of the Canadian Transport Commission

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CONTENTS

	Page
1. Introduction	1
2. The Study Programme	3
3. Economic Perspective	6
4. Supply	7
5. Demand	11
6. Efficiency, Input Prices and Unit Costs	13
7. Financial Analysis	14
8. Implications	16

APPENDICES (UNDER SEPARATE COVER)

FLEET CAPACITY AND FINANCIAL HEALTH

CANADIAN LEVEL I AIRLINES

1. Introduction

This report is intended to serve as a culmination to a CTC Research programme of studies relating to the financial health of Canada's major (Level I) airlines, and their investments in aircraft. While individual projects were reported on completion, this report summarizes pertinent findings of interest in the context of the competition-focused regulatory climate as of July 1984.

The research programme, the implications of which are discussed here, followed from joint study by representatives of the Level I airlines, and the Air Transport Committee and Research Branch of the CTC. It involved four topics: equipment and fleet planning, airline financial performance, the impact of inflation on financial viability, and the effectiveness of fare increases as a means of improving airline financial viability. The airline representatives prepared a report, "Airline Financial Performance: Importance of Return on Investment to Financial Viability"[1] (Importance of Return on Investment), in which they concluded that fleet investments of the order of $4.5 billion would be needed over the 1981-1985 period, and that the airlines' financial ratios were such that this capital must come largely from internally generated funds. This implied a higher return on investment, which, in turn, required the approval of higher fares.

Companion CTC reports include "The Demand for Long Haul Air Travel in Canada"[2] (The Demand for Air Travel) by John Kuiper, Department of Economics, University of Ottawa, "Equipment and Fleet Planning in the Canadian Airline Industry"[3] (Equipment and Fleet Planning) by the Research Branch, CTC, and "Inflation and the Canadian Airline Industry"[4] (Inflation and the Airlines) by the Research Branch, CTC and J.B. Waugh, School of Business, Carleton University. These three reports appeared during 1982 as CTC Research Working Papers, and reviews and exchanges of comments and observations on all the reports took place in the first half of 1983.

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[1] Airline Financial Performance: Importance of Return on Investment to Financial Viability, Industry Task Force Report, March 1982.

[2] The Demand for Long Haul Air Travel in Canada, Research Branch, CTC, April 1982, WP No. 10-82-04.

[3] Equipment and Fleet Planning in the Canadian Airline Industry, Research Branch, CTC, August 1982, WP No. 10-82-05.

[4] Inflation and the Canadian Airline Industry, Research Branch, CTC, December 1982, WP No. 40-82-10; updated January 1984, WP No. 40-84-01.

Events have overtaken the airline position, as they have overtaken some of the related CTC research directed towards the question of whether fare increases really would lead to an improvement in the airlines' financial state, and whether it was, in fact, as grave as contended. However, at this time when competition, pricing and costing have become the foci, much of this work can usefully be reinterpreted within the current context. Available data have been analyzed to produce a 1984-based (updated) perspective on fleet capacity, demand, investment requirements and financial state and performance of the Level I carriers. This report employs available statistics, primarily taken from CTC and Statistics Canada publications and airline company annual reports. In addition to data, the latter also provide insight as to company intentions and the behaviour of management under various circumstances.

Specifically, the objectives of this report are:

(i) to summarize developments in the Canadian airline industry (Level I carriers) over the past six years (from 1978 through 1983);

(ii) to provide some insight into ways and means employed by the Level I airlines to overcome major difficulties facing the industry over the past three years (1981-83);

(iii) to present a picture of the industry at the threshold of the new major initiatives aiming at "liberalization" of the regulatory framework affecting domestic markets;

(iv) to offer a qualified outlook for 1984-1985 based on analysis of developments and trends perceived from (i) to (iii) above, and on observed airline reaction to the policy of enhanced competition.

The next section of this report briefly summarizes those aspects of the study programme that have ongoing relevance. This is followed by a review of the economic perspective facing the airlines as of mid 1984 and sections discussing recent developments concerning the supply of aircraft capacity and the demand for air travel and transport. Section 6 takes a brief look at recent airline efficiency improvements and Section 7 presents the highlights of an analysis of the change in airline financial circumstances between 1978 and 1983. Finally, preliminary indications of carrier response to anticipated capacity supply and demand, under relaxed pricing and entry regulation, and the resulting fare level and financial implications, are discussed.[5]

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[5] As mentioned in more detail in the sections concerned, more than one data source was employed. On several occasions, one data source was used for some carriers, while equivalent figures were developed for other carriers using different data, and the two sets combined. This does not give neat results, particularly with respect to internal consistency. However, it does give the most accurate and up-to-date picture possible. The two general criteria were: use the most accurate non-confidential data available, and provide a

2. The Study Programme

In November 1980, the major Canadian airlines approached the Canadian Transport Commission, arguing that, in considering applications for fare increases, it paid insufficient attention to "rate of return on investment". They implied that a substantial improvement in airline financial performance was needed to enable large scale investments in new aircraft. In response, the Air Transport Committee and the Research Branch of the Canadian Transport Commission jointly undertook a program of studies concerning airline pricing and financial performance. At the same time, the CTC invited the Level I carriers to a structured exchange of views with the government study group.

The study programme was directed at identifying factors "which bear upon those capital related issues associated with the overall justification of changes in fares and rates".[6] More specifically, the terms of reference stated that:

> "This program is being undertaken on a joint basis by the Air Transport Committee and the Research Branch of the Canadian Transport Commission under the overall direction of the Chairman, Air Transport Committee, and the Vice-President (Research). The review will focus on four topics: equipment and fleet planning, level of financial performance (earnings), impact of inflation (current value accounting), and the effectiveness of fare increases".

Following consultations, it was agreed that the airlines would undertake an active role, and their representatives submitted the report, Importance of Return on Investment in March 1982. The report examined the airlines' financial performance in the 1970's, and asserted that their financial positions were deteriorating due to a combination of increasing costs and temporarily weakening market demand. Further, they contended that, unless this situation changed dramatically, the availability of internally generated funds for planned investments would further diminish. At the same time, it was argued that the source of favourable debt financing and debt related funding available for aircraft purchases during the 1970's would not be as available in the future.

The airlines argued that significant capital investment would be required to replace outdated aircraft, and to provide needed new capacity.

Footnote Continued
complete picture if at all possible. Although this approach resulted in adequate precision to substantiate the report's implications, representations of the same parameter sometimes differ (slightly). Where this occurred, the figures have not been "adjusted"; adjustment might have made the reader more comfortable, but accuracy, traceability and an understanding of the range of data precision would have been lost.

[6] Letter from the Secretary of the ATC to Airline Presidents, 15 May 1981.

Projected 1980 to 1985 growth in the available seats put forward for the various airline systems ranged from highs of 55% and 50% in the case of EPA and Wardair, to lows of nil for Nordair and 10% for Air Canada. These capacity increases would require $4.5 billion of capital expenditure between 1981 and 1985. The Airline Task Force concluded that the airlines' financial positions were such that the capital must come largely from internally generated funds, implying a higher return on investment, which in turn required the approval of higher fares.

A companion CTC report, Equipment and Fleet Planning presented an analysis of the developments which took place in the airline industry during the 1970-80 period with emphasis on such areas as the airlines' fleet, capacity, output and investment patterns. The airlines' fleet plans for the period ending in 1985 were outlined and an analysis of projected equipment acquisitions presented. On the basis of the data collected, the report suggested that, in aggregate, the airlines' fleet plans as of the end of 1980 amounted to a 20% increase in passenger carrying capacity by 1985. However, based on the (then) available statistics, a decline in traffic volume for 1981 and a further decline in 1982 were suggested. These declines in traffic volume, when contrasted with the 1981 airline plans, amounted to a significant amount of over-capacity in 1982. It was also noted that forecasts of the demand for air travel for the 1983-85 period were subject to a great deal of uncertainty in regard to both general economic trends and the level of air fares. The report suggested that, subject to an in-depth study of market potential, it could be presumed that unless air fares declined in real terms, the volume of traffic required to make full use of projected 1985 capacity would be unlikely to materialize.

The question of the effectiveness of fare increases was examined in the report, The Demand for Air Travel prepared for the CTC by J. Kuiper of the Department of Economics, University of Ottawa. The responsiveness of demand to changes in fares, or demand price elasticity, was examined for selected cities on the transcontinental routes, specifically those between Toronto and Montréal in Central Canada and Calgary, Edmonton and Vancouver in Western Canada. Time series data were used in the analysis, and the measure of demand was postulated to be a function of some measure of price (various fares, weighted) and measures of socio-economic activity (e.g., national/regional disposable income). The report suggested that the demand for air travel in the Alberta market is more responsive to income changes than is the case for the Vancouver market. Thus, it was concluded that personal disposable income is not the only motivating force in the demand for travel.

Origin-destination traffic data produced, in absolute terms, a higher price elasticity and a lower income elasticity than the revenue-passenger miles data. Estimates of elasticities, therefore, were found to be sensitive to the measure of demand. As the responsiveness of demand to price changes differs substantially among long-haul markets, a classification of price-elasticity estimates by broad distance categories might not allow a proper assessment of price-elasticity. The response of travellers to changes in price is such that a carrier's profit may not be improved by uniformly increasing fares over its entire network.

Another topic identified in the terms of reference, the impact of inflation (current value accounting), was addressed in the report, Inflation and the Airlines prepared by the CTC Research Branch and J.B. Waugh of the School of Business, Carleton University. This report was intended to provide an assessment of the impact of inflation, over the past decade (1970-1980), on the major Canadian carriers from both an economic and an accounting perspective.

In Part 1 (The Impact of Inflation) the rate of inflation over the past decade, using the Consumer Price Index (CPI) as a measure, was compared and contrasted with trends in operating costs and operating revenues. In general, it was found that the major airlines have been able, over this period, to absorb or cushion themselves to a degree from the impact of inflation. Of the influences which pushed costs upward, fuel price increases, particularly over 1973-1975 and 1979-1981, have been the most significant variable. On the revenue side of operations, there was evidence that, to the extent the carriers were able to absorb the impact of inflation, benefits accrued to the consumer (the air traveller).

A difference in the nature of fuel expenses, labour expenses and material and supplies, on one hand, and 'current' costs and capital-related expenses, on the other was noted. The largest capital-related expense was depreciation, which is based on the original cost of the capital assets employed. In an inflationary period, this expense item represents a level of funds that is not sufficient to replace worn out and obsolete capacity.

A special issue related to the treatment of capital expenditures by the accounting system, and whether the end product of the system was informative or, could be improved. In periods of inflation, several problems arise with respect to the treatment of assets using historical cost accounting procedures. Part II of this report, "Accounting for Inflation", addressed these issues from an accountant's perspective, placing them within the relevant context of the investigation. In the traditional accounting income model, assets are valued at the date of acquisition, based on the acquisition price. Thereafter, the value remains constant until a change is realized through an external transaction. Changes in value are recognized only in the period when such a change is realized, not as the value changes over time. Under stable price conditions there is no problem; however, in periods of changing prices serious timing errors emerge.

Two basic approaches to the problem of accounting for inflation -- General Price Level Accounting and Current Cost Accounting -- were put forward. The first approach, General Price Level Accounting, substitutes units of purchasing power for monetary units which are unstable and do not reflect changing values. Reported income is corrected by indexing inventory costs and depreciation by the rate of inflation, and the reduction in the real value of net debt is also recorded. This approach preserves the traditional historical cost model of accounting, adjusting only for the unit of measure.

The second approach -- Current Cost Accounting -- attempts to replace historical dollar costs with current values when measuring assets and/or liabilities. It deals with specific price changes as inflation

affects each firm (differently). Using this approach to recognition of capital gains on tangible assets, and changes in the market price of outstanding debt, adjustments to traditional accounting are required for increases in the replacement cost of capital assets and inventories. Reported profits must also be corrected to take account of general price inflation. The report notes that the current cost accounting model that has received the most support is 'replacement cost' accounting.

Both approaches, General Price Level Accounting and Current Cost Accounting, have certain advantages/disadvantages which were outlined in the report. Also, an attempt was made to assess the significance of a restatement, from historical cost to common dollars (General Price Level Accounting) and to current costs, on the financial reports of the major Canadian carriers as well as several U.S. carriers. It was found that, using either General Price Level Accounting or Current Cost Accounting, rates of return would be significantly lower than historical cost rates, reflecting the impact of reduced profit figures resulting from higher depreciation allowances over a greater asset base. It was also noted that the review of alternative accounting approaches presented in Part II of the report did not address the impact of inflation on the determination of the cost of capital. Thus, the lower rates of return that result from the revised accounting procedures would not be comparable to the cost of capital determined from the traditional accounting model.

3. Economic Perspective

The analyses illustrated in Figure 1 and Appendix 1 suggest that air transportation may have reached the stage of a mature industry. It may even have entered the decline phase, with air travel/transport accounting for a decreasing proportion of economic activity. This milestone in the industry's life cycle, if in fact it has been reached, is only evident from the most recent data. However, the implications of a decline are such that the possibility should be taken seriously, and a suggested fall in the income elasticity of demand for air travel between 1981 and 1983 could persist. As data reflecting the apparent demand resurgence of the first half of 1984 become available, the picture may change, but historical growth rates are unlikely to persist over the longer term.

It is relevant to note the consistency of an achievement of industry maturity with the relaxed carrier protection features of current air policy. Also consistent are the general fall in passenger revenue yield relative to the economy fare, and the increase in the diversity and importance of discount fares as illustrated in Figure 2. The "six and five" programme would have been expected to affect price and revenue statistics, inasmuch as it limited economy fare increases. However, the observed increase in fare discounting during the "6 and 5" period suggests that economy fares were actually raised (the airlines took the maximum allowed, plus an allowance for fuel prices) beyond levels supportable by demand. Evidence is insufficient to conclude definitely that economic circumstances facing the air carriers will not turn around, but it is unlikely that the climb in the relative importance of air transport is going to persist.

These pessimistic implications were drawn from data, some of it preliminary estimates, that could also be interpreted to support the thesis that prosperity will return as the business cycle progresses. The pessimistic perspective is, however, deemed appropriate as a background to this report; the Airline Task Force was originally motivated by the alleged poor financial health of the airlines, and there has been further deterioration in the interim. The current regulatory climate of relaxed pricing and entry regulation provides both opportunities (even under the pessimistic scenario outlined above) and pitfalls. The obvious opportunity for the industry as a whole is to exploit each market to the extent of its individual potential, pricing discriminatorily to get the maximum out of the market demand; this (all else equal) should lead to an increase in volume. On the other hand, opportunities for individual carriers are likely to involve exit from routings where they are at a disadvantage, and the elimination of competitors from other routes (if not from the industry). The general fare increases, that the airlines in their 1982 report concluded were necessary to the industry's financial survival, are most unlikely in the short run.

From this perspective, the interaction between the carriers' current and planned fleet capacity, travel/transport demand and the carriers' financial health will govern the service provided to travellers and shippers in the short term, and the longer run evolution of the industry.

4. Supply

Industry Task Force Projections[7]

Anticipation of strong and continuing growth in demand for air travel, as well as the need to replace older equipment, prompted the airlines to enter into a phase of planned aircraft acquisitions in 1978. These factors were reflected in the capacity projections compiled in late 1981 by the Industry Task Force, and contained in their 1982 report Importance of Return on Investment. In terms of available seats, capacity was expected to increase by approximately 20% over the 1980-85 period. These projected increases fell into three categories:

(i) largely replacements of capacity, associated with a modest growth in available seats (zero for Nordair and 10% for Air Canada),

(ii) considerable increases in available seats (25% for CP Air and 29% for PWA), and

(iii) very substantial increases in available seats (49% for Wardair and 55% for EPA).

The associated capital expenditure plans (including the one for Quebecair) amounted to some $4.5 billion, spread rather evenly over the 1980-85 period.

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[7] Importance of Return on Investment op. cit.

1982 CTC Projections[8]

As a supporting analytical tool, the Research Branch of the CTC developed a common measure of capacity expressed in maximum (weight limited) payload tons for different types of aircraft. These weights, averaged on an annual basis, provided a fairly uniform measure of capacity owned and operated by the airlines. In 1982, a capacity forecast was developed by the CTC for the period up to 1985, based on the projections contained in the Importance of Return on Investment report, information contained in the various airlines' annual reports for the 1978 to 1981 period, and additional information volunteered by some airlines.

According to the forecast, the anticipated growth in industry capacity, as measured in payload tons, amounted to 17.6% over the 1980-85 period. In the case of Nordair and Air Canada only modest increases in capacity were anticipated, while Wardair and EPA intended to expand considerably. The CTC projections also included an estimate for Quebecair, which amounted to a 28% increase in payload tons over the period 1980-85.

The key aspect of the airlines' fleet and capacity expansion was the planned acquisition of B767 and A310 aircraft. These potential acquisitions amounted to a total of 32 airplanes; 18 B767s for Air Canada, four B767s each for CP Air and PWA, and 6 A310s for Wardair. The CTC report projected $4.3 billion of capital expenditures over the 1980-85 period, a figure somewhat below the Airline Task Force estimates.

Current Fleet Projections

During the 1982-83 period it became evident that the airlines made substantial changes to their previous fleet plans as a result of the continuing drop in demand. This necessitated a revision and update of the previous (1982) CTC capacity estimates. The current forecast (Tables 1 and 2) incorporates the changes indicated by the airlines, arrives at a revised fleet status as of the end of 1983, and provides appropriate projections for 1984 and 1985.

Changes to the airlines' plans since 1981 involved both modifications to planned acquisitions and the retirement/sales of older aircraft. The major changes to previously planned aircraft procurements are:

- Although Air Canada's 1982 Annual Report refers to 18 B767s (including an option for procurement of six aircraft in 1985) and three additional L1011s, the 1983 Annual Report does not refer to the option or the L1011s, implying a 12 aircraft procurement programme through 1984.

- CP Air in its 1983 Annual Report declared cancellation of the order for the four B767s; instead, CP Air intended to acquire 10 B737-300 aircraft, over the period 1985-88 (two B737-300 are assumed to be acquired by the end of 1985).

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[8] Equipment and Fleet Planning op. cit.

- PWA in its 1982 Annual Report indicated the intention to spread the planned procurement of four B767s over time; two to be delivered in 1983, with the procurement of the remaining two postponed until 1986-87. This intention was restated firmly in the 1983 Annual Report.

- Wardair first noted, and then confirmed, the indefinite postponement of the six A310s in its 1982 and 1983 Annual Reports.

In summary, the current forecasts indicate a total of 14 B767 aircraft and no A310s in operation during 1985 (compared with earlier plans for 26 and 6 respectively). Parallel developments have taken place in the areas of accelerated retirements of obsolete airplanes (especially DC8 aircraft), sales of older B737 models, and the acquisition of updated versions of this airplane as well as a scaling down in the size of certain types of equipment. The major changes in this field are:

- Air Canada has retired all DC8s from passenger service, (15 in total) and stored three older B747 models out of the total B747 fleet of seven. This move was accomplished in two stages; early in 1982, eight DC8s and two B747s were put in storage, while the additional DC8s and one B747 were withdrawn from service during 1983.

- CP Air has sold five older B737s and its remaining two B727s. It also cross-leased three of its eight long-range DC10-30s for three DC10-10 lighter and shorter range aircraft (plus $8 million annually).

- PWA and Nordair also disposed of their older B737 models (five and two respectively). In addition, Nordair disposed of two DC8 aircraft that had not been in use since 1981, while acquiring three additional turbo-prop FH227s. PWA reduced the number of L100s (Hercules) from two to one, and Quebecair disposed of three out of four B737s acquired in 1981, and leased four HS748 turbo-prop aircraft.[9]

- No major changes have been noted in the case of EPA. EPA apparently did not proceed with the replacement of its aging B737s implied in their 1981 capacity forecast. The recent acquisition of EPA by CP Air puts the airline's fleet planning into a new context. Similar uncertainties might also apply to Nordair and possibly to Quebecair, but obviously for different reasons.

Considerable changes also took place between 1981 and 1983 in the utilization of various aircraft types. Equipment became more specialized, and was used to a greater extent in specific markets, enabling a closer matching of demand and capacity. Examples of this process include:

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[9] FH227 and HS748 have approximately 40% to 50% of the seating capacity of a B737.

- Air Canada withdrew its B747 aircraft from transcontinental routes in early 1982; this move was accompanied by an increased use of L1011s and B727s on these high-density routes.

- Both Air Canada and CP Air reserved the use of B747s for high-density international routes; even on these markets, increased use of the smaller long range L1011s and DC10s was noticeable. This applied also to Wardair's fleet utilization, especially in 1983. Excess capacity wide-bodied aircraft (especially B747s) are utilized increasingly in international charter services.

- There was also a noticeable realigning of aircraft sizes and frequency of service on transborder and near south (Caribbean, Mexico) operations and domestic services other than long-haul transcontinental routes.

- All major airlines indicated increased use of mixed configurations in aircraft interiors with varying proportions of high quality/high priced facilities, all tourist, passenger/cargo combinations, etc.

- There appears to be a growing tendency to interface "hub and spoke" type networks with other Level I and local airlines (e.g., CP Air/EPA, PWA/Time Air, CP Air/AirBC).

- Reallocation (and sometimes acquisition or leasing) of smaller turbo-prop equipment to service low traffic routes in the North and elsewhere was evidenced. These airplanes are also capable of offering flexible interior arrangements to accommodate varying passenger/freight configurations.

- Lowering the degree of utilization of the existing fleet or "trading frequency for load factor" is very pronounced in the case of Wardair, which showed a 10% reduction in fleet utilization between 1982-83.

A more detailed description is provided in Appendix 2, which is a reprint of relevant sections of the 1983 Annual Reports of Air Canada, CP Air, PWA and Nordair and of Wardair's 1982 Annual Report, relating to fleet plans and utilization.

Current Capacity Projections

Given the number of aircraft by type and carrier, and their associated payloads, resulting changes in capacity were developed. These forecasts by airline, expressed in active payload tons, are contained in Table 1. As mentioned earlier, the CTC 1982, Equipment and Fleet Planning report, forecasted a 17.6% growth in capacity between 1980-85, while the current projections indicate an increase no higher than 4.1% (see Table 3 which also contains, as a reference, the Airline Task Force projections). This estimate is based on the assumption that Air Canada will reactivate the three B747s by the end of 1985. If Air Canada decides to dispose of this equipment, the resulting industry capacity would be almost identical to that existing at the

end of 1980 (0.5 of a percent decrease). On the other hand, if Air Canada proceeds with the option for the six B767s, and keeps the three B747s, the overall increase will be approximately 8%.

As illustrated in Table 4, the various changes in fleet plans, as outlined, affect the average system aircraft size, both in terms of payload tons and number of seats. At the end of 1980 the average aircraft size was estimated at 24.9 payload tons and had an average of 150 seats. The forecast contained in the CTC 1982 Equipment and Fleet Planning report implied an increase in average aircraft size to 26.7 payload tons and an average 160 seats per aircraft, or an increase of about 7%. The current forecast envisages 25.9 payload tons and 156 seats per aircraft, or a 4% increase over the average aircraft size in 1980. In summary, the revised forecast envisages fleet capacity at the end of 1985 to be some 11.5% lower than the 1982 CTC forecast, of which 8.5% may be related to a reduction in the size of the fleet, and 3% to a reduction in the average aircraft size.

Capital expenditure estimates associated with the revised capacity forecast are shown in Table 5. Actual capital expenditures through 1983 based on information contained in the airlines' annual reports over this period amounted to $2.14 billion. An estimate for capital expenditures for 1984-85, consistent with information available (including capital commitments specified and reported by some of the airlines) amounts to about $1.0 billion, providing a revised total of $3.1 billion for the period 1981-85, with some $450 million committed in the 1986-88 time frame.

5. Demand

As outlined in the previous section, one of the factors which influenced the Canadian airlines to enter into a phase of planned aircraft acquisitions in 1978, was the anticipation of strong and continuing demand for air travel. As indicated in Table 6, with the exception of 1979, this anticipation did not materialize for the industry as a whole. Considerable re-alignment in market shares, as measured by revenue passenger miles, also took place in the 1978-83 period. Air Canada's share in total traffic decreased from 54% in 1978 to 49% in 1983 and the "Regionals'" from 12% to 10%. At the same time, CP Air increased its share from 23% to 26% and Wardair from 11% to 15%, indicating that Air Canada's loss in percentage terms was shared about equally by these two airlines.

To stimulate demand and fill otherwise empty seats the airlines embarked on extensive fare discounting. This was illustrated in Figure 2, of Section 3, where the fall in passenger revenue yield relative to the economy fare was presented, with the divergence being especially noticeable after 1981. To further explore and illustrate this phenomenon a passenger "dilution" factor was developed which relates actual revenue from scheduled services to a theoretical scheduled revenue based on full economy fares. The calculation assumed that demand remained unchanged and that Air Canada's domestic fare formula was applied to the traffic. Data for Air Canada, CP Air, PWA and Wardair are illustrated in Figure 3. Appendix 3 presents calculations pertaining to the theoretical revenue.

Not surprisingly, Wardair (with lower charter fares) shows the greatest percent "dilutions" from the "theoretical revenue", followed by CP Air. Also, while the percentage of actual to theoretical revenue has shown a generally declining trend over the period, the drop in 1982 (except for PWA) is the most noticeable. This observation corresponds to the divergence between passenger yield and the economy fare. In the short-run, especially in view of increased competition, a reversal of the discounting trend is not likely,[10] and the general fare increases as envisaged in the Airline Task Force report as a means to ensure the industry's financial health would be unlikely to prove effective.

A dual strategy of the airlines, capacity adjustments (as discussed in Section 4) and attempts to stimulate demand, resulted in three out of the four airlines having passenger load factors in 1983 (in spite of a sharp drop in industry demand) exceeding those in 1978 (see Table 7). In financial terms, however, the results were less than a real success (see Section 7) and led to heavy losses in the industry.

The success or failure of fare increases or discounting is partly a function of the responsiveness of demand to changes in fares, known as the demand price elasticity. The sensitivity of price elasticity estimates to various measures of demand, price and socio-economic activity was tested.[11] Also tested was the question of whether elasticities vary by market. The results, summarized in Table 8, suggest that the responsiveness of demand to price changes differs substantially between the various long-haul markets, and the estimates of elasticities were found to be sensitive to measures of demand. It can also be inferred that the quantity demanded within a specific fare class, would fall significantly as a result of fare increases, and that low-priced air fare travellers require price stimulation. The required level of stimulation also varies by market. The results again indicate that overall fare increases are not likely to solve the industry's financial predicament but rather selective, market (route and service) specific action would be more logical.

Supply and demand are closely related and neither should be considered in isolation. The implications of capacity increases, therefore, were examined in relation to traffic volumes. The approach followed in the analysis was to first infer an approximate level of output directly from the projections of fleet capacity. This level of output is referred to as the "capacity-constrained output". The second step was to contrast the capacity-constrained output for the total industry with expectations for market growth.

For the purposes of the studies the capacity-constrained level of output expressed in revenue passenger miles (RPM) was calculated from the projections of fleet capacity, expressed in average payload tons (APT), by

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[10] This topic is explored extensively in "The Low-Priced Air Fare Review: The First Five Years", Research Branch, CTC, November 1983, Report No. 1983/05.

[11] The Demand for Air Travel op. cit.

applying an output:capacity ratio. This output:capacity ratio is defined as the ratio of output (RPM) to average fleet capacity (APT). The output:capacity ratio has been developed to provide a linkage between airlines' output and the physical assets represented by the fleet of aircraft. Its primary use is to explore the implications of projected fleet size in terms of expected market growth. (For the derivation of this measure see Section A.3 of Appendix A of the CTC 1982 Equipment and Fleet Planning report).

Table 9 presents and contrasts the results of the CTC 1982 and current analysis. The 1982 Equipment and Fleet Planning report concluded that while fleet capacity was projected to increase by 17.6% for the 1980-85 period, capacity constrained output was expected to increase by 20% in the same time frame. In 1981, actual traffic volumes were 7% less than the capacity constrained level of output, and in 1982 the forecast traffic was almost 14% less. Thus, it appeared that a significant over-capacity situation was likely to develop.

According to the updated forecast, average payload is projected at 5505 tons and capacity constrained output at 26.9 billion revenue passenger miles by 1985, both of which are a considerable drop from the previous estimates. To achieve zero excess capacity, 6% and 6.9% annual increases in traffic are required for 1984 and 1985 respectively. These aggregate increases do not appear unrealistic for the industry as a whole -- all else remaining equal. However, with increased competition and realignment of market shares among the Level I airlines, as well as the indicated expansion of Level II and III carriers into some short haul routes, the appropriateness of individual carriers' fleets to the demand circumstances they will face is questionable. This is discussed further in Section 8.

6. Efficiency, Input Prices and Unit Costs

An analysis of the effects of inflation on the major Canadian airlines over the 1970-80 period was provided by a CTC report[12] "Inflation and the Canadian Airline Industry" where the CPI, as a measure of inflation, was compared and contrasted with trends in operating costs and operating revenues. The present section provides an evaluation of the airlines' operating performance over the period 1978-83, and while it utilizes data consistent with the above report, it attempts to separate efficiency indicators (partial productivity measurements) from the impact of input unit prices and other factors. It should be noted that depreciation and amortization are not analyzed in this section but are considered in Section 7.

Efficiency measures for the Level I carriers and the economy as a whole are illustrated in Figure 4. It should be noted that while each airline efficiency measure exhibits improvement in excess of that achieved by

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[12] Inflation and the Canadian Airline Industry, Research Branch, CTC, December 1982, WP No. 40-82-10.

the economy as a whole, the one relating (maximum) payload ton miles[13] to the number of gallons of fuel consumed has increased substantially since 1978. Over the period, output increased by 12.9% while fuel consumption actually declined by 4.4%, reflecting (among economies) the industry's acquisition of more fuel efficient aircraft.

The Level I airlines reacted to the continuing fall in demand and profitability in 1982 and 1983 by cutting costs, especially labour. This has allowed the growth in output per employee to continue during 1982 and 1983, even though actual output has declined. Trends illustrated in Table 10 indicate that input prices, other than fuel, have followed the same general pattern as the CPI. In addition, annual growth in total operating expenses (exclusive of depreciation and amortization) per payload ton mile has, on average, slightly outpaced the Gross National Product (GNP) deflator, at 12.8% vs. 11.6%.[14]

Figure 5 portrays approximate ranges of unit costs for 1978-1982 (operating expenses excluding depreciation and amortization) per payload ton mile by major groups of service and average stage length. While it is generally recognized that unit costs are inversely related to average stage length, the shorter haul unit costs, in absolute terms, experienced a more rapid growth over the period. The "other domestic" market as contrasted against the transcontinental market demonstrates this trend. Also, the inherently lower indirect costs associated with charter services versus scheduled unit toll services is highlighted by the lower unit costs for international charter.

7. Financial Analysis

The Level I airlines in their report Importance of Return on Investment presented the historical rate of return data shown in Table 11. These data were compared to similarly calculated averages for other industries, and a conclusion to the effect that airline rates of return were inadequate was drawn. The analyses presented in the current report explored this premise and the companion issue of airline financial viability, both in greater detail and with the benefit of an additional three years of data.

The airlines as corporate entities are far from homogeneous, and the extent to which financial and operating data are available differs. The intent of this study was to capture the airline operations, as distinct from all commercial activities of the companies, and to do so in as comparable a manner as possible. Thus, while Statistics Canada was the primary source for operational data (all airlines except Wardair), the airline's annual corporate reports were used as sources of financial data whenever possible (generally for all airlines except EPA and Quebecair). While there is

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[13] Payload ton miles calculated as the product of (maximum) payload tons of each aircraft type and miles flown by type of aircraft.

[14] The use of the CPI and GNP deflator is questioned as more appropriate indices could have been found. Their use, however, has been maintained so as to preserve continuity with the previous reports.

general comparability, the return on investment figures of Table 12 differ somewhat from those of the 1982 Importance on Return of Investment report. As can be clearly seen from the table, return on investment may have been low in the years to 1980, but it has deteriorated markedly since then. It is certainly far from the 19% the airlines argued was necessary to meet their cost of capital.

The airlines financial performance over the 1978-1983 period is shown in absolute terms in Table 13; financial data for the major airlines (Air Canada, CP Air, PWA and Wardair) are summarized in more detail in Appendix 4. Again, it is clear that, with the possible exceptions of PWA and Nordair, industry margins are thin; just how thin is illustrated in Table 14. The table also indicates the sensitivity of airline fortunes to revenue, either in terms of passenger yield (average fare level) or load factor, all else equal. As an order of magnitude, a 1% improvement in either would have doubled 1983's industry net income. Cost savings without loss of revenue would have a similar effect. It can be concluded, therefore, that the industry is sensitive to economic fluctuations. This is reflected by the return on equity data of Table 15.

Also partly responsible for the instability in the return on equity data is the capital structure, and its shift over time as illustrated in Table 16. Several features are worthy of particular note. First, Air Canada's equity, restored through a 1978 conversion of $324 million in debt to equity under the Air Canada Act of 1977, fell markedly over the last two years. This deterioration in debt:equity ratio, while not grave in itself, when combined with the dramatic cash squeeze indicated by the working capital trends (a loss of $350 million over 5 years) illustrated by Table 17, suggests approaching capital difficulties. CP Air's fall (a $140 million working capital deterioration, and increase in long term debt to virtually 90% when arrested by what amounts to a debt to equity conversion by its parent) must be viewed seriously, but in the perspective of CP Ltd.'s financial strength. Wardair's situation, negative and deteriorating working capital combined with negative and deteriorating equity, speaks for itself.

The Canadian airlines, with a 150% annual asset turnover, are not a capital intensive industry. Further, the airline industry is characterized by fungible (with alternative use) assets (approximately 80% of the total) for which an active market exists. Most of the infrastructure is provided by government without long term financial commitment on the part of the airlines. In this regard, air transport differs markedly from other industries in the regulated sector such as rail, telecommunications or pipelines. Servicing their debt is certainly a problem for the airlines, but it is not the cause of their malaise. To view the situation in perspective one must recognize that interest on its long term debt only accounts for 3.5% of Air Canada's operating revenue; even for Wardair, with its 112% debt capital structure, this figure is less than 6%. Individually, the airlines have no problems that, all else equal, a 5% improvement in load factor would not solve. Indeed, as the airlines claim, return on investment is below cost of capital; however, there is also excess capacity.

Freedom to increase fares, as requested by the airlines, would not fully resolve the problem; with relaxed entry regulation its impact would be

limited. Relaxed entry regulation would encourage aggressiveness and efficiency, and more active competition could achieve what regulation and a high degree of direct government (federal and provincial) involvement has been unable to do -- restrain the number of active competitors on a given routing. The analysis reported here suggests the presence of operating and expanding Canadian airlines, persisting under circumstances where a businessman, who was interested solely in maximum return on his investment, would contract or close down his airline operations and redeploy his resources in more lucrative ventures. Thus, it is possible that the industry will persist at a less than economically efficient level indefinitely, but the financial circumstances of the airlines give a clear indication of the direction industry attrition would take.

When one views the Level I airlines as they enter a period of more active competition, it is relevant to focus on the differences. In 1983, both CP Air and PWA received substantial infusions of equity, the former over $200 million from its CP Ltd. parent, and the latter $100 million from a market issue. The trend in Air Canada's financial state is towards a point, perhaps in 1985 or 1986, where the government is obligated to contribute further equity. Air Canada's debt burden gives it financial security regardless of any intentions of a government of the day; the government ownership and debt:equity covenants of its United States Export-Import Development Bank loans preclude it ever falling into financial circumstances approaching those Wardair is facing. Nordair enjoys northern routings that are protected from competition, and EPA is effectively now part of CP Air. This leaves Quebecair and Wardair. Quebecair will survive or disappear on the basis of non-economic government objectives, and it is small in any event.

The future for Wardair could be interesting. Its working capital deficit is serious, and with negative equity, further debt issue (except conceivably tied to equipment purchase) is most unlikely. Wardair needs equity, but with its debt burden and a fleet of wide-bodied aircraft, neither suited to active competition on low density Canadian routings, nor currently in demand on the resale market, substantial new equity on favourable terms is unlikely. Without help, Wardair could not withstand a sustained competitive attack.

8. Implications

Although the recent shift in the commercial and regulatory context, under which Canadian airlines operate, makes prediction distinctly speculative, certain implications (if not conclusions) can be drawn. The Level I carriers are unlikely to again enjoy sustained traffic growth rates at levels experienced prior to 1980. Therefore, success of a particular airline is likely to occur only at the expense of others. Competitive success is expected to depend on two factors. Marketing, and thus the degree of acceptance of an airline by the travelling public, is likely to be a major consideration, but one whose success or failure can not be guaged at this time. The other major factor is the airline's financial strength and the suitability of its fleet under the competitive circumstances with which it is faced. In this aspect, new entrants are also a consideration.

The new domestic air policy was designed to encourage increased airline competition, but not to precipitate cataclysmic change. As intended, change has been gradual but steady, with no evidence of instability. There is some, unsurprising, evidence of the direction in which the carriers are moving since the introduction of the new policy. However, because the policy, to a large extent, formalized a trend towards increased competition that has been encouraged for some years, there is a substantial further body of carrier reaction evidence available. Two trends, with equipment implications, are apparent.

The first is an accentuation of competition on the highest density transcontinental long-haul routes that were the traditional source of surplus. Recent evidence of this includes Wardair's proposed entry into the unit toll market, and PWA's move to institute longer legs and nonstop services. Further evidence of this competitive focus is found in the shifting trend of discounts. Basically, discount fares as originally introduced in the late 1970s -- Advance Booking Charters (ABCs), Charter Class Canada, Courier Jet, Nighthawk, Skybus and off season Seat Sales -- focused on inducing travel demand that would not fly at full fare, and pursuading travellers to patronize off-peak flights. Thus, these programmes were aimed at overall cost effectiveness and industry revenue expansion. An examination of the recent history of fare discounting, however, indicated a shift of focus towards inter-carrier competition.

Wardair began offering domestic ABCs in 1980, and by mid 1981 Air Canada and CP Air were offering special packages restricted to specific city pairs. By mid 1982 most Air Canada discount introductions were relatable to programmes introduced by CP Air and (particularly) Wardair to improve their market share. May 1983 saw Air Canada and CP Air offering fare packages tailored for "PWA-competitive" and "Wardair-competitive" routes, and the end of 1983 saw Saver Class Merry Christmas Sale "Wardair-competitive" Air Canada and CP Air fares. Importantly, from the perspective of this analyses, these were restricted to Toronto-Vancouver, Toronto-Edmonton and Toronto-Calgary.

A variation of this theme, that is particularly apparent after the May 1984 policy announcement, is increased competition among Level I carriers on both shorter-haul and (lower density) Atlantic Canada routings. The former is represented by Nordair's 50% stand-by fares, presumably intended to improve its load factor by "skimming" primarily Air Canada traffic without cutting into its competitor's market sufficiently to "wake the sleeping giant". The latter is illustrated by the July 1984 announcements by CP Air and EPA of transcontinental discounts for the autumn, and by Air Canada and Nordair of their decision to match them.

The second trend with equipment implications for the Level I carriers is the expansion of Level II carriers into their short-haul markets. Examples include City Express' expansion in the Ottawa-Toronto market with its acquisition of DHC7 aircraft, AirBC's expansion in Vancouver-Victoria-Seattle, Time Air on the Prairies, and Air Ontario. If trends towards this sometimes competitive sometimes cooperative shift continue, they would have the result of forcing small jet aircraft (DC9 and B737) out of the short haul segment. The extent to which this will occur is not yet clear, but it will contribute to availability of these aircraft for longer hauls.

The projected overall shorter term effect on equipment is a squeeze on the B747, L1011 and DC10 aircraft in long-haul transcontinental service. Traffic densities are such that, with more carriers operating and the need to maintain departure frequency to avoid the loss of full-fare paying passengers, it will be increasingly difficult to maintain satisfactory load factors with large aircraft. On the other hand, smaller turbojet aircraft will be released from short-haul to fill the gap. The overall efficiency effects of this will be mixed. On the short-haul side, expansion of the turboprop carriers in this market could be expected to improve economy for origin-destination passengers, but there will be some losses where the short-haul is but one leg of a larger trip. The retirement of wide-bodied aircraft in favour of less comfortable and higher seat-mile cost smaller ones will, of itself, have a negative effect. Competition, however, is a stimulus to efficiency, and should lead to cost reduction.

Some of the negative effects above may be only short term, but the effects of a changed competitive environment on the carriers will be permanent. In any industry where competitors are of unequal strength, one of the longer term effects of less regulated competition may be a reduction in the number of competitors. This is made more likely when there are "spoils" of economies of density to accrue to the survivor(s). Viewing the carriers as they enter a phase of increased competition, Air Canada, with its (still regulated) overseas operations utilizing many of its large aircraft, and a fleet of new B767s that offer appropriate size, operating economy and wide body comfort, is in a strong position. Wardair's equipment circumstances represent the opposite extreme, while CP Air, PWA and Nordair have fleets of sufficiently efficient and small sized aircraft to offer them flexibility as the less regulated environment unfolds.

Table 1

LEVEL I AIRLINES: ACTIVE FLEET BY AIRLINE 1978-1985

Number of Aircraft

	1978	1979	1980	1981	1982	1983	Forecast 1984	Forecast 1985
Air Canada	106	115	124	125	115	108	112	115
CP Air	24	31	30	32	31	31	31	33
Wardair	6	6	6	7	7	7	7	7
PWA	26	23	25	28	24	22	22	22
Nordair	14	16	16	16	18	16	17	17
EPA	9	9	9	10	10	10	11	12
Quebecair	9	6	8	7	9	12	12	12
TOTAL	194	206	218	225	214	206	212	218

Payload Tons

	1978	1979	1980	1981	1982	1983	Forecast 1984	Forecast 1985
Air Canada	2 725	2 964	3 144	3 370	3 025	2 815	2 991	3 239
CP Air	784	968	1 006	1 066	1 050	1 029	1 029	1 065
Wardair	379	434	434	486	486	486	486	486
PWA	417	390	422	463	390	394	394	394
Nordair	229	261	225	225	236	204	220	220
EPA	114	114	114	120	120	120	136	152
Quebecair	105	56	88	97	119	99	99	99
TOTAL	4 753	5 187	5 433	5 827	5 426	5 147	5 355	5 655

Sources: (1) Airlines Annual Reports, 1981-1983.
(2) Aviation Statistics Centre, Statement 30 - "Fleet Report", Quarterly.
(3) Research Branch, CTC, "Equipment and Fleet Planning in the Canadian Airline Industry", August 1982, WP No. 10-82-05.

Table 2

LEVEL I AIRLINES: ACTIVE FLEET BY AIRCRAFT CLASS 1978-1985

	1978	1979	1980	1981	1982	1983	Forecast 1984	Forecast 1985
WIDE BODY								
B747	13	15	15	15	13	12	12	15
DC10	2	4	6	9	11	11	11	11
L1011	10	10	10	16	18	18	18	18
Sub-Total	25	29	31	40	42	41	41	44
CTC '82 Forecast	25	29	31	40	42	42	42	42
LARGE JETS								
DC8/B707	45	40	35	29	14	7	6	6
B767	-	-	-	-	2	7	14	14
B727	19	28	37	36	40	40	40	40
Sub-Total	64	68	72	65	56	54	60	60
CTC '82 Forecast	64	68	72	65	63	64	70	77
OTHER JETS								
B737	37	46	52	65	62	53	55	58
DC9	46	46	46	41	37	35	33	33
BAC111/F-28	5	3	3	3	5	5	5	5
Sub-Total	88	95	101	109	104	93	93	96
CTC '82 Forecast	88	95	101	110	113	112	109	109
NON-JETS								
HS748	3	3	3	4	4	8	8	8
FH227/F27	6	6	6	3	5	5	5	5
Other	8	5	5	4	3	5	5	5
Sub-Total	17	14	14	11	12	18	18	18
CTC '82 Forecast	17	14	14	11	12	12	11	11
TOTAL ALL AIRCRAFT	194	206	218	225	214	206	212	218
CTC '82 Forecast	194	206	218	226	230	230	232	239

Sources: (1) Airlines Annual Reports, 1981-1983.
(2) Aviation Statistics Centre, Statement 30 - "Fleet Report", Quarterly.
(3) Research Branch, CTC, "Equipment and Fleet Planning in the Canadian Airline Industry", August 1982, WP No. 10-82-05.

Table 3

PROJECTIONS OF CAPACITY GROWTH

	AIRLINE TASK FORCE(1)	CTC '82 REPORT(2)			CURRENT FORECAST	
	% Seat Growth 80-85	Payload Tons 1980	Payload Tons 1985	% Growth 80-85	Payload Tons 1985	% Growth 80-85
Air Canada	9.9	3 144	3 357	6.8	3 239	3.0
CP Air	25.3	1 006	1 266	25.8	1 065	5.9
Wardair	48.9	434	696	60.4	486	12.0
PWA	29.0	422	551	30.6	394	(6.7)
Nordair	NIL	225	226	.4	220	(2.2)
EPA	54.9	114	180	57.9	152	33.3
Quebecair	N.A.	88	113	28.4	99	12.5
TOTAL	N.A.	5 433	6 389	17.6	5 655	4.1

Sources: (1) Research Branch, CTC, "Equipment and Fleet Planning in the Canadian Airline Industry", August 1982, WP No. 10-82-05.
(2) Importance of Return on Investment to Financial Viability, Industry Task Force, March 1982, Table E.2, p. 29.

Table 4

ACTIVE FLEET, CAPACITY, AND SIZE OF AIRCRAFT AT YEAR END

	Ref. 1980	1981	1982	1983	1984	1985
NO. OF A/C AT YEAR END*						
CTC '82 Report	218	226	230	230	232	239
Current Forecast	218	225	214	206	212	218
PAYLOAD TONS AT YEAR END*						
CTC '82 Report	5 433	5 844	5 934	5 994	6 184	6 389
Current Forecast	5 433	5 827	5 426	5 147	5 355	5 655
AVG. SIZE OF A/C AT YEAR END*						
CTC '82 Report	24.9	25.9	25.8	26.1	26.7	26.7
Current Forecast	24.9	25.9	25.4	25.0	25.3	25.9
MAXIMUM SEATS PER A/C						
CTC '82 Report	150	155	155	157	159	160
Current Forecast	150	155	152	153	156	156

* Refers to active aircraft only.

Sources: (1) Airlines Annual Reports, 1981-1983.
(2) Aviation Statistics Centre, Statement 30 - "Fleet Report", Quarterly.
(3) Research Branch, CTC, "Equipment and Fleet Planning in the Canadian Airline Industry", August 1982, WP No. 10-82-05.

Table 5

CAPITAL EXPENDITURES

ACTUALS AND FORECASTS
($ millions)

	1981	1982	1983	1984	1985	Sub-Total 81-85
Air Canada						
Airline Task Force	501	393	441	512	462	2 309
CTC '82 Report						2 179
Current Forecast	472	304	344	480	160	1 760
CP Air						
Airline Task Force	270	232	80	105	211	898
CTC '82 Report						896
Current Forecast	242	230	57	51	110	690
Wardair						
Airline Task Force	75	14	179	173	141	602
CTC '82 Report						528
Current Forecast	84	11	7	12	20	134
PWA						
Airline Task Force	94	-	170	87	101	452
CTC '82 Report						452
Current Forecast	100	71	120	24	35	350
Eastern Regionals						
Airline Task Force	48	42	27	65	34	216
CTC '82 Report						225
Current Forecast	60	35	7	47	27	176
TOTAL						
Airline Task Force	988	701	897	942	949	4 477
CTC '82 Report						4 280
Current Forecast	958	651	535	614	352	3 110

Sources: (1) Airlines Annual Reports, 1981-1983.
(2) "Importance of Return on Investment to Financial Viability", Industry Task Force Report, March 1982.
(3) Research Branch, CTC, "Equipment and Fleet Planning in the Canadian Airline Industry", August 1982, WP No. 10-82-05.

Table 6

TRAFFIC: REVENUE PASSENGER MILES BY MARKETS
(billions)

	1978	1979	1980	1981	1982	1983
Air Canada						
Domestic Scheduled	6.40	7.61	7.86	7.69	7.01	6.70
International Scheduled	5.62	6.81	6.90	6.27	5.73	5.45
Charter	.54	.21	.42	.37	.83	.58
Total	12.56	14.63	15.18	14.33	13.57	12.73
CP Air						
Domestic Scheduled	1.79	2.18	2.65	2.85	2.45	2.54
International Scheduled	2.95	3.02	3.15	3.14	3.08	3.19
Charter	.62	.73	.83	.91	1.09	1.08
Total	5.36	5.93	6.63	6.90	6.62	6.81
Regionals						
Domestic Scheduled	1.20	1.70	1.91	2.00	1.65	1.58
Charter	1.76	1.72	1.08	1.28	1.06	1.12
Total	2.96	3.42	2.99	3.28	2.71	2.70
Wardair						
Charter	2.36	3.39	3.80	3.52	3.84	3.85
TOTAL						
Domestic Scheduled	9.39	11.49	12.42	12.54	11.11	10.82
International Scheduled	8.57	9.83	10.05	9.41	8.81	8.64
Charter	5.28	6.05	6.13	6.08	6.82	6.63
System Total	23.24	27.37	28.60	28.03	26.74	26.09
INDEX (TOTAL)						
Domestic Scheduled	1.00	1.22	1.32	1.34	1.18	1.15
International Scheduled	1.00	1.15	1.17	1.10	1.03	1.01
Charter	1.00	1.15	1.16	1.15	1.29	1.26
System Total	1.00	1.18	1.23	1.21	1.15	1.12
ANNUAL PERCENTAGE CHANGE (%)						
Domestic Scheduled		22.4	8.1	1.0	(11.4)	0.0
International Scheduled		14.7	2.2	(6.4)	(6.4)	(1.9)
Charter		14.6	1.3	(.8)	12.2	(2.8)
System Total		17.7	4.5	(2.0)	(4.6)	(2.4)

Source: (1) Aviation Statistics Centre - Statement 3 - Unit Toll Services, and Statement 4 - Charter and Contract Flying Services - 1983 Preliminary.

Table 7

PASSENGER SERVICES: 4 MAJOR AIRLINES

VALUES	1978	1979	1980	1981	1982	1983
AVAILABLE SEAT MILES (BIL)						
Air Canada	20.03	22.25	22.52	22.01	21.52	19.59
CP Air*	6.88	7.36	8.26	8.73	8.45	8.20
PWA*	1.32	1.60	1.73	1.92	1.76	1.71
Wardair(e)	3.02	4.39	4.83	4.86	5.29	4.81
REVENUE PASSENGER MILES (BIL)						
Air Canada	12.56	14.63	15.18	14.35	13.59	12.73
CP Air*	4.74	5.20	5.80	5.99	5.53	5.73
PWA*	.73	.85	.93	1.05	.93	.90
Wardair	2.36	3.39	3.80	3.52	3.84	3.85
PASSENGER LOAD FACTOR (%)						
Air Canada	62.7	65.8	67.4	65.2	63.1	65.0
CP Air*	68.9	70.6	70.1	68.7	65.5	70.0
PWA*	55.3	52.8	53.5	54.5	52.7	52.4
Wardair	78.1	77.2	78.7	72.4	72.6	80.0
INDICES						
AVAILABLE SEAT MILES						
Air Canada	1.00	1.11	1.12	1.10	1.07	.98
CP Air*	1.00	1.07	1.20	1.27	1.23	1.19
PWA*	1.00	1.21	1.31	1.45	1.33	1.30
Wardair	1.00	1.45	1.60	1.61	1.75	1.59
REVENUE PASSENGER MILES						
Air Canada	1.00	1.16	1.21	1.14	1.08	1.01
CP Air*	1.00	1.10	1.22	1.26	1.17	1.21
PWA*	1.00	1.16	1.27	1.44	1.27	1.23
Wardair	1.00	1.44	1.61	1.49	1.63	1.63

* Scheduled services only. (e) Estimated

Source: (1) Airlines' Annual Reports, 1978-1983.

Table 8

DEMAND ELASTICITIES

A

PRICE AND INCOME ELASTICITIES BY MARKETS

	Toronto to Alberta (O/D)	Montréal to Alberta (O/D)	Toronto to Vancouver (O/D)	Montréal to Vancouver (O/D)	Toronto/Montréal to Vancouver (O/D)	Toronto/Montréal to Vancouver (RPM)
Price Elasticities	-0.939	-0.996	-1.449	-1.983	-1.712	-1.389
Income Elasticities	2.043	1.652	1.316	0.537	1.050	1.464

B

EFFECT UPON DEMAND OF A 5% TO 30% INCREASE IN THE GENERAL FARE LEVEL
(per Capita Model)

	Percentage Decrease in Demand					
Percentage Increase In Fare	Toronto to Alberta (O/D)	Montréal to Alberta (O/D)	Toronto to Vancouver (O/D)	Montréal to Vancouver (O/D)	Toronto/Montréal to Vancouver (O/D)	Toronto/Montréal to Vancouver (RPM)
5	4.70	4.98	7.25	9.92	8.56	6.95
10	9.39	9.96	14.49	19.83	17.12	13.89
15	14.09	14.94	21.74	29.75	25.68	20.84
20	18.78	19.92	28.98	39.66	34.24	27.78
25	23.48	24.90	36.23	49.58	42.80	34.73
30	28.17	29.88	43.47	59.49	51.36	41.67

C

EFFECT UPON DEMAND OF A 5% INCREASE IN THE DIFFERENCE BETWEEN
DEEP DISCOUNT CLASS FARES AND ECONOMY CLASS FARES

	Percentage Decrease in Demand					
Percentage Increase In Fare Differences	Toronto to Alberta (O/D)	Montréal to Alberta (O/D)	Toronto to Vancouver (O/D)	Montréal to Vancouver (O/D)	Toronto/Montréal to Vancouver (O/D)	Toronto/Montréal to Vancouver (RPM)
5	1.8	1.0	2.1	1.0	1.6	1.2
10	3.6	2.0	4.2	2.0	3.1	2.4
15	5.4	3.1	6.3	3.0	4.7	3.7
20	7.2	4.1	8.4	4.0	6.2	4.9
25	9.0	5.1	10.5	5.0	7.8	6.1
30	10.8	6.1	12.6	6.0	9.3	7.3

D

EFFECT UPON DEMAND OF THE INTRODUCTION OF DEEP DISCOUNT FARES

Markets	Percentage Increase in Demand
Toronto - Alberta (O/D)	23
Montréal - Alberta (O/D)	13
Toronto - Vancouver (O/D)	28
Montréal - Vancouver (O/D)	12
Toronto/Montréal - Vancouver (OE/D)	19
Toronto/Montréal - Vancouver (RPM)	15

Source: (1) Research Branch, CTC, Transport Review, November 1983, p. 70.

Table 9

TREND IN CAPACITY-CONSTRAINED OUTPUT 1978-1985

	Average Payload Tons (APT)	Capacity-Constrained Output (RPM) (BIL)	Actual Traffic (RPM) (BIL)	Traffic Shortfall (%)
1978	4 695	24.66	23.68*	(4.0)
1979	4 970	26.45	27.36	3.4
1980	5 310	28.43	28.59	.6
AVERAGE 78-80	4 992	26.51	26.54	0
CTC '82 REPORT				
1981	5 637	30.21	28.10	(7.0)
1982	5 888	31.58	27.3 (e)	(13.6)
1983	5 963	32.04	-	-
1984	6 071	32.79	-	-
1985	6 269	34.08	-	-
CURRENT REPORT				
1981	5 630	30.21	28.03	(7.2)
1982	5 627	30.18	26.74	(11.4)
1983	5 287	28.4	26.10	(8.1)
1984	5 251	28.2	27.70 (e)	(1.8)
1985	5 505	29.6	29.60 (e)	0

* Includes Transair.
(e) Estimated

Sources: (1) Airlines Annual Reports, 1981-1983.
(2) Aviation Statistics Centre, Statement 3 - Unit Toll Services and Statement 4 - Charter and Contract Flying Services.
(3) Research Branch, CTC, "Equipment and Fleet Planning in the Canadian Airline Industry", August 1982, WP No. 10-82-05.

Table 10

LEVEL I AIRLINES: INPUT PRICES, OPERATING EXPENSES, AND UNIT COSTS

	1978	1979	1980	1981	1982	1983
INPUT PRICES						
Average Fuel Price (¢)	59.4	69.1	95.8	132.1	145.8	133.7
Wages, Salaries & Benefits/Employee ($000)	22.3	24.3	26.7	30.3	33.9	37.0
Other Expenses/Employee ($000)	21.4	24.0	26.5	29.1	32.4	34.3
OPERATING EXPENSES ($ MILLION)						
Fuel Expense	424	551	763	1 041	1 074	905
Labour Expense	789	.918	1 081	1 249	1 358	1 370
Other Expenses (Including Rentals)	754	909	1 075	1 197	1 296	1 270
Total (Excl. Dep'n. & Amort.)	1 967	2 378	2 919	3 487	3 728	3 545
Depreciation and Amortization	149	167	200	240	260	265
Total Operating Expenses	2 116	2 545	3 119	3 727	3 988	3 810
UNIT COSTS						
Total Operating Expenses (Excl. Dep'n. & Amort.)/Payload Ton Mile (¢)	32.1	34.3	41.1	47.3	51.0	51.2
Dep'n. and Amort./Payload Ton Mile (¢)	2.4	2.4	2.8	3.3	3.6	3.8
INDICES						
Average Fuel Price	1.00	1.16	1.61	2.22	2.45	2.25
Wages, Salaries & Benefits/Employee	1.00	1.09	1.20	1.36	1.52	1.66
Other Expenses/Employee	1.00	1.12	1.24	1.36	1.51	1.60
Operating Expenses (excl. Dep'n. & Amort.)/Payload Ton Mile	1.00	1.07	1.28	1.47	1.59	1.60
Dep'n. and Amort./Payload Ton Mile	1.00	1.00	1.17	1.38	1.50	1.58
Gross National Product Deflator	1.00	1.10	1.22	1.35	1.49	1.58
Consumer Price Index	1.00	1.13	1.26	1.44	1.51	1.59

Sources: (1) Aviation Statistics Centre - Statement 21 - Statement of Income, and Statement 32(I,II,III) - Fuel, Oil and Employment Report - 1983 Preliminary.
(2) Statistics Canada Publications, Catalogue No. 11-003E, No. 11-004E.

Table 11

ANNUAL AIRLINE RETURN ON INVESTMENT*

FOR THE FISCAL YEARS ENDED DECEMBER 31

Air Carrier	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Average
Air Canada	4.7%	5.7%	5.9%	5.4%	5.1%	6.1%	8.7%	9.4%	9.2%	8.7%	6.9%
CP Air	6.2	7.7	7.3	7.2	3.4	2.3	9.1	17.9	11.9	7.7	8.1
Eastern Provincial Airways	6.6	8.5	7.8	4.2	2.5	5.3	6.0	12.6***	12.1	12.2	7.8
Nordair	10.7	7.3	12.2	7.3	8.9	9.3	13.2	24.3	8.2	11.8	11.3
Pacific Western Airlines***	12.3	11.1	9.7	7.8	9.2	8.0	9.0	7.1	9.1	9.1	9.2
Quebecair	6.6	12.1	13.8	6.7	4.1	2.1	14.2	10.2	7.8	4.8	8.2
Transair	5.9	12.6	12.6	8.2	(1.4)	(9.5)	13.1	15.1	19.0	**	8.4
Wardair	11.7	6.6	13.1	9.3	15.9	10.2	14.8	12.3	8.5	19.5	12.2
Group Average	8.1	8.9	10.3	7.0	6.0	4.2	11.0	13.6	10.7	10.5	9.0
Group Average for Scheduled Carriers	7.6	9.3	9.9	6.7	4.5	3.4	10.5	13.8	11.0	9.0	8.6

* Defined as: (Net Income After Income Taxes + Interest Expenses) ÷ (Average Total Invested Capital).
** Transair was absorbed by Pacific Western Airlines.
*** Excluding gains on disposals.

Source: (1) Importance of Return on Investment to Financial Viability, Industry Task Force Report, March 1982, Table D.1.

Table 12

RETURN ON INVESTMENT*

	1978	1979	1980	1981	1982	1983
Air Canada	9.4%	9.7	9.2	8.0	2.3	5.7
CP Air	17.8	11.8	7.7	4.1	3.3	3.4
Wardair	8.1	5.3	13.6	5.6	5.6	9.0
PWA	7.0	10.5	10.0	13.2	8.5	7.8
Nordair	22.5	9.2	11.5	12.0	1.6	14.5
EPA	19.6	11.4	10.3	21.2	10.9	1.3
Quebecair	10.7	8.0	4.7	.7	(11.3)	(26.4)
Industry Total	10.3	9.6	9.5	7.8	3.4	5.2

* defined as (net income + interest on long term debt) ÷ average total invested capital.

Sources: (1) Airline Annual Reports for Air Canada, CP Air, PWA, Nordair, and Wardair.
(2) Statistics Canada Publication, Catalogue No. 51-206 for EPA and Quebecair.

Table 13

OPERATING INCOME[1], INTEREST ON LONG TERM DEBT (LTD), NET INCOME
($ millions)

		1978	1979	1980	1981	1982	1983
Air Canada	Operating Income	84	101	90	73	(26)	28
	Interest on LTD	46	46	44	55	63	80
	Net Income	47	55	57	40	(33)	4
CP Air	Operating Income	44	33	22	(3)	(26)	(2)
	Interest on LTD	11	15	22	38	57	39
	Net Income	21	16	7	(17)	(35)	(13)
Wardair	Operating Income	5	12	50	29	7	27
	Interest on LTD	11	22	22	24	26	21
	Net Income	-	(10)	8	(11)	(13)	(3)
PWA	Operating Income	12	14	19	26	25	27
	Interest on LTD[2]	7	21	22	28	23	21
	Net Income	8	13	12	18	6	11
Nordair	Operating Income	5.6	4.4	7.6	6.8	(1.6)	4.1
	Interest on LTD	.5	1.3	3.6	4.3	3.2	2.6
	Net Income	4.6	2.1	2.7	2.5	(2.4)	5.0
EPA	Operating Income	2.0	.9	.5	7.6	3.3	(6.8)
	Interest on LTD[3]	2.5	2.1	1.9	3.5	3.9	3.4 (e)
	Net Income	3.3	1.0	.9	4.4	.9	(2.9) (e)
Quebecair	Operating Income	1.6	(2.0)	.9	(2.4)	(7.4)	(8.2)
	Interest on LTD[3]	2.2	2.6	3.0	7.2	9.4	3.8
	Net Income	(.2)	(1.0)	(1.4)	(6.8)	(16.6)	(16.6)
TOTAL	Operating Income	154	163	190	137	(26)	69
	Interest on LTD	80	110	119	160	185	171
	Net Income	84	76	86	30	(93)	(16)

Notes:

[1] Operating income - profit (loss) from operations based on total operating revenues less total operating expenses (including interest on long term debt).
[2] Includes dividends on preferred shares.
[3] For 1978-1982, total interest expense.

(e) Estimated

Sources: (1) Airline Annual Reports for Air Canada, CP Air, PWA, Nordair and Wardair.
(2) Statistics Canada Publication, Catalogue No. 51-206 and Aviation Statistics Centre - Statement 21 - Statement of Income for EPA and Quebecair.

Table 14

NET INCOME MARGIN*-- MAJOR AIRLINES -- 1978-1983

	1978	1979	1980	1981	1982	1983
Air Canada	3.6	3.4	3.0	1.8	(1.4)	.2
CP Air	4.5	2.9	1.0	(2.1)	(4.1)	(1.5)
PWA	4.5	6.4	4.9	5.8	1.9	3.4
Wardair	-	(4.7)	2.7	(3.5)	(3.8)	(.8)

* Net Income divided by Total Operating Revenue.

Source: (1) Airlines Annual Reports, 1978-1983.

Table 15

RETURN ON EQUITY[1] -- MAJOR AIRLINES -- 1978-1983

	1978	1979	1980	1981	1982	1983
Air Canada	20.4	12.6	11.9	7.8	(6.5)	0.8
CP Air	52.5	19.8	7.0	(17.0)	(39.3)	(6.3)*
PWA	25.0	31.0	21.8	25.7	7.3	7.9**
Wardair	0	(250)	400	(1100)	***	***

[1] Net Income divided by average of yearly opening and closing equity.
* Reflects substantial conversion of debt into equity by CP Ltd. parent.
** Reflects substantial equity injection.
*** Wardair's negative equity in these years leads to meaningless results.

Source: (1) Airlines Annual Reports, 1978-1983.

Table 16

LONG TERM DEBT* AS A PERCENT OF TOTAL CAPITAL**

	1978	1979	1980	1981	1982	1983
Air Canada	59	57	56	57	65	69
CP Air	67	70	76	84	89	59
PWA	89	85	83	77	75	60
Wardair	96	100	97	102	109	112

* Includes current portion of LTD.
** Deferred Taxes not included.

Source: (1) Airlines Annual Reports, 1978-1983.

Table 17

WORKING CAPITAL[1] -- MAJOR AIRLINES -- 1978-1983
($ millions)

	1978	1979	1980	1981	1982	1983
Air Canada	299	269	205	12	(35)	(49)
CP Air	4	(17)	(35)	(58)	(110)	(136)
PWA	175	152	137	59	44	77 [2]
Wardair	6	0	2	(15)	(30)	(19)

[1] The measure used here -- current assets-current liabilities excluding the current portion of the long term debt -- departs from the usual accounting definition of working capital. It does, however, provide a time series that is more indicative of financial trends.

[2] The 1983 figure for PWA should be viewed in the light of the major financing and accounting restatements that occurred during that year.

Source: (1) Airlines Annual Reports, 1978-1983.

Figure 1

AIR TRANSPORT REVENUE AS A PERCENT OF GROSS NATIONAL PRODUCT

Sources: (1) Aviation Statistics Centre - Statement 21 - Statement of Income - 1983 Preliminary

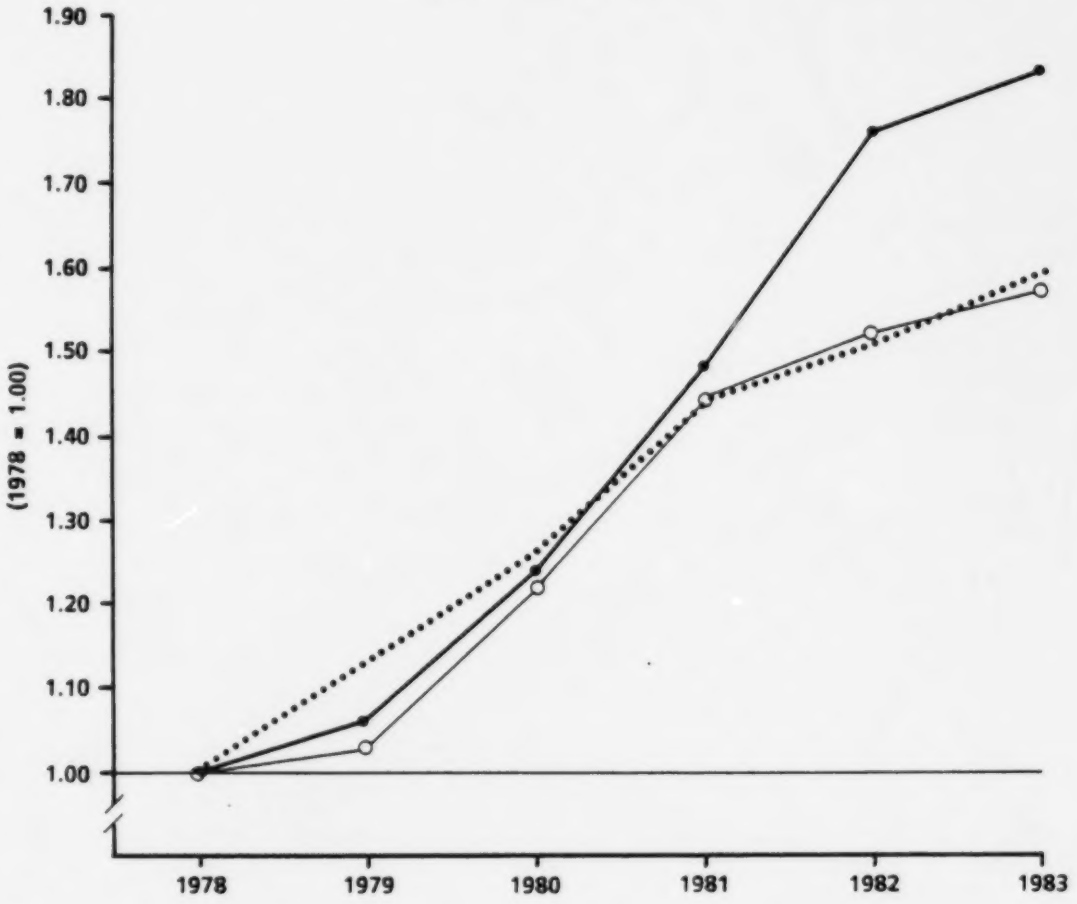
(2) Research Branch, CTC, "Equipment and Fleet Planning in the Canadian Airline Industry", August 1982, WP No. 10-82-05

(3) Statistics Canada Publications, Catalogue No. 11-003E, No. 11-004E

(4) Wardair International Annual Report 1983

Figure 2

AIR FARE INDICES



Sources: (1) Aviation Statistics Centre - Statement 3 - Unit Toll Services - Revenue Operating Statistics - 1983 Preliminary, and Statement 4 - Charter and Contract Flying Services - Revenue Operating Statistics - 1983 Preliminary

(2) Research Branch, CTC, "Inflation and the Canadian Airline Industry", December 1982, WP No. 40-82-10

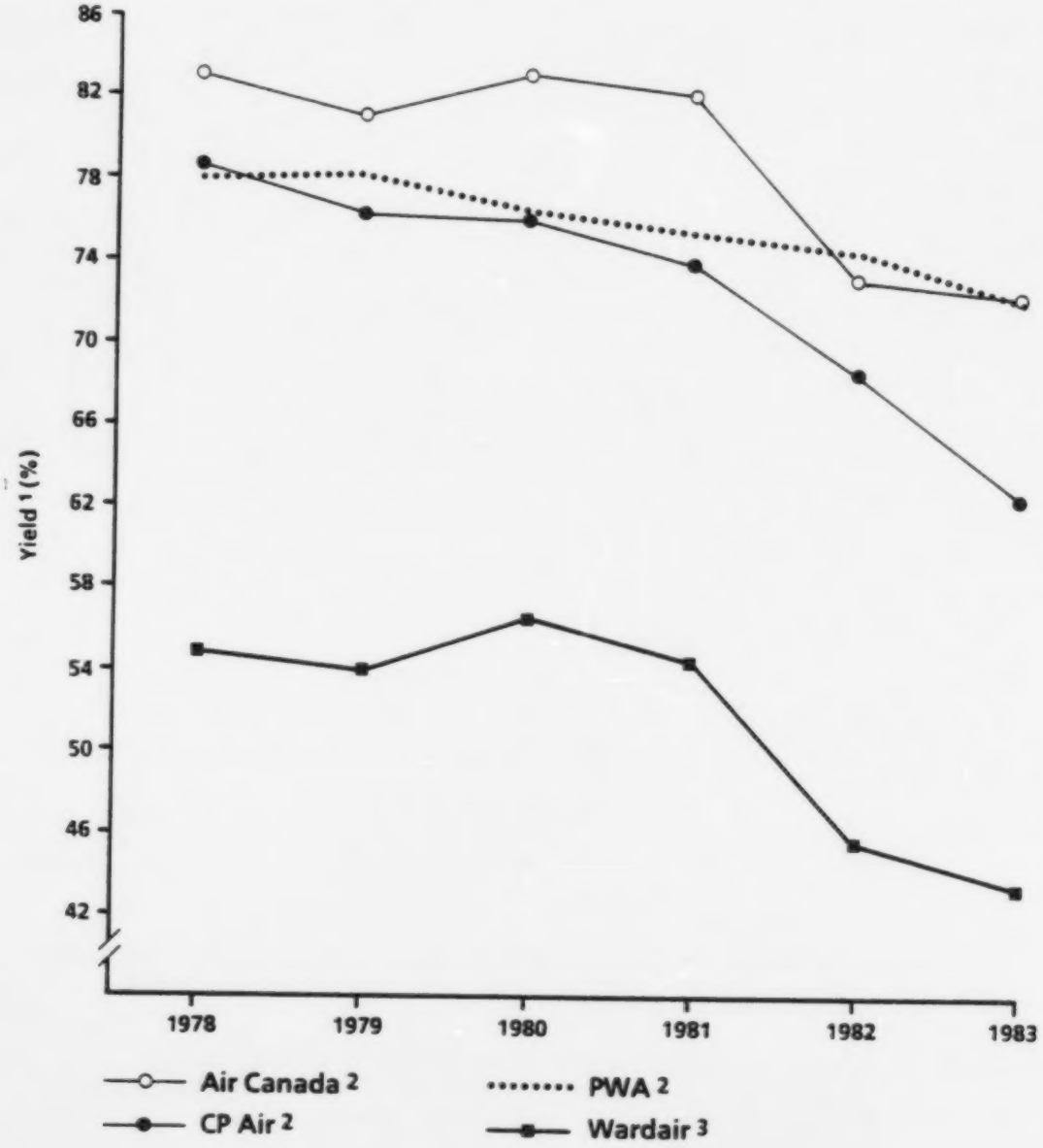
(3) Statistics Canada Publications, Catalogue No.51-206, No.62-010

(4) Tariffs filed with the Air Transport Committee - 1983 Estimated

(5) Wardair International Annual Report 1983

Figure 3

PASSENGER FARE "DILUTION"



1 Actual Revenue ÷ (Loadings x "Full" Economy Fare)

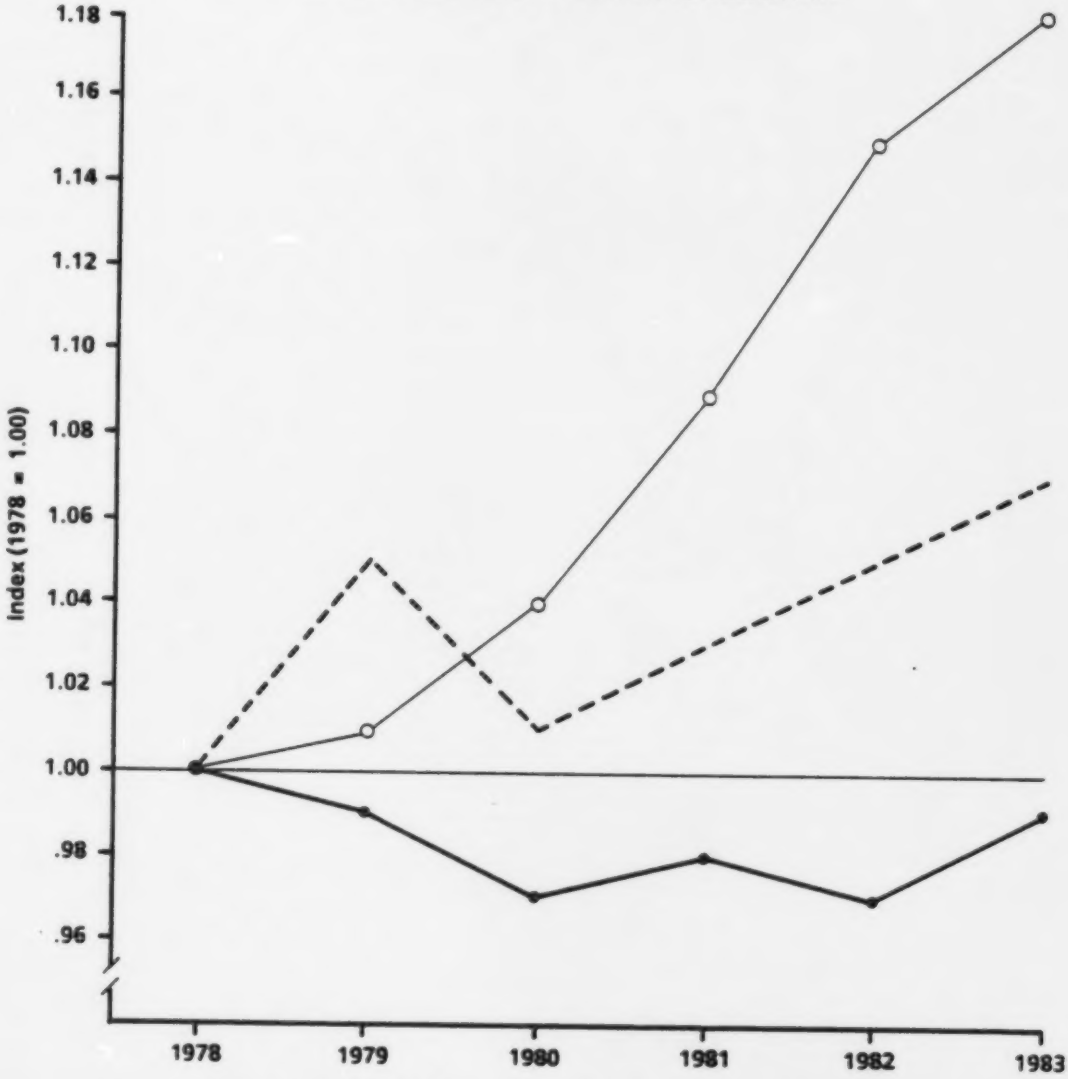
2 Scheduled Passenger Revenue Only

3 Charter Revenue Excluding Tours

Source: (1) Airlines Annual Reports, 1978-1983

Figure 4

EFFICIENCY MEASURES
LEVEL I AIRLINES VS. GENERAL ECONOMY

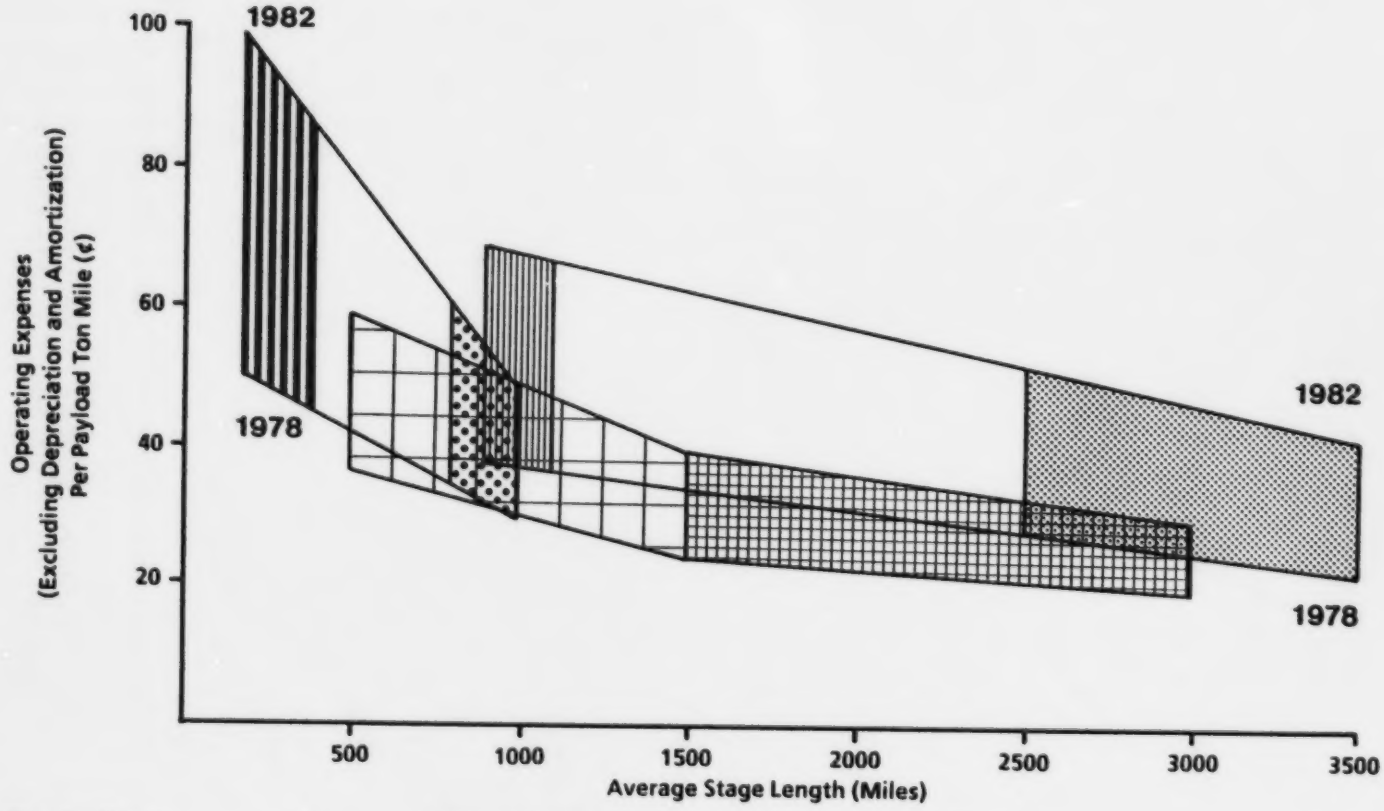


Sources: (1) Aviation Statistics Centre - Statements 3 and 4, and Statement 32 (I, II, III) - Fuel, Oil, and Employment Report - 1983 Preliminary

(2) Statistics Canada Publications, Catalogue No. 11-003E, No. 11-004E

Figure 5

LEVEL OF UNIT COSTS
BY SERVICE AND BY MARKET



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Canadian Transport Commission
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Fleet Capacity and Financial Health Canadian Level I Airlines

Appendices

WP 60-84-13/Appendices

Canada

FLEET CAPACITY AND FINANCIAL HEALTH
CANADIAN LEVEL I AIRLINES

APPENDICES

Canadian Transport Commission

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FLEET CAPACITY AND FINANCIAL HEALTH

CANADIAN LEVEL I AIRLINES

APPENDICES

Appendix 1 Level I Airlines vs. Economy

Table A.1.1 Volumes and Values
Table A.1.2 Yields and Price Indices and Passenger Fares
Table A.1.3 Inputs, Outputs and Efficiency
Table A.1.4 4 Major Airlines vs. Level I Airlines

Appendix 2 Airline Fleet Plans in 1983 Annual Reports
Air Canada, CP Air, PWA, Nordair, Wardair (1982)

Appendix 3 Passenger Services - 4 Major Airlines

Table A.3.1 Air Canada's Domestic Economy Fare Formula 1978-83
Table A.3.2 Passenger Fare Dilution 1978-83

Appendix 4 Financial Analysis - 4 Major Airlines 1978-83

Table A.4.1 Air Canada: Capacity and Capital Accounting
Table A.4.2 Air Canada: Income, Returns, Balance Sheet
Table A.4.3 CP Air: Capacity and Capital Accounting
Table A.4.4 CP Air: Income, Returns, Balance Sheet
Table A.4.5 PWA: Capacity and Capital Accounting
Table A.4.6 PWA: Income, Returns, Balance Sheet
Table A.4.7 Wardair: Capacity and Capital Accounting
Table A.4.8 Wardair: Income, Returns, Balance Sheet

Annex A: Capacity Measures - Developments in Methodology

APPENDIX 1

Level I Airlines vs. Economy

Table A.1.1 Volumes and Values
Table A.1.2 Yields and Price Indices and Passenger Fares
Table A.1.3 Inputs, Outputs and Efficiency
Table A.1.4 4 Major Airlines vs. Level I Airlines

APPENDIX 1

LEVEL I AIRLINES VS. ECONOMY

TABLE A.1.1

VOLUMES

		1978	1979	1980	1981	1982	1983
LEVEL I AIRLINES							
Revenue Ton Miles	MIL	2 892	3 324	3 454	3 430	3 316	3 305 (e)
(Maximum) Payload Ton Miles	MIL	6 136	6 928	7 096	7 372	7 307	6 930 (e)
Weighted Load Factor*	%	47.1	48.0	48.7	46.5	45.4	47.7 (e)
ECONOMY							
GNP (Constant 1971 $)	$BIL	126.3	130.4	131.7	136.1	130.1	134.1
Employment	MIL	9.99	10.40	10.71	11.01	10.64	10.73
ANNUAL CHANGE							
Revenue Ton Miles	%	9.5	14.9	3.9	(.7)	(3.3)	(.3)
(Maximum) Payload Ton Miles	%	9.0	12.9	2.4	3.9	(.9)	(5.2)
GNP (Constant 1971 $)	%	3.5	3.2	1.0	3.3	(4.4)	3.1
Employment	%	3.5	4.1	3.0	2.8	(3.4)	.8

* Defined as: Revenue Ton Miles ÷ (Maximum) Payload Ton Miles.

(e) Estimated

VALUES

		1978	1979	1980	1981	1982	1983
LEVEL I AIRLINES							
Total Operating Revenue (TOR)	$MIL	2 323	2 784	3 381	3 906	3 957	4 015 (e)
ECONOMY							
GNP (Current $)	$BIL	232.2	264.3	296.6	339.1	356.6	388.7
Personal Disposable Income	$BIL	156.1	176.0	199.4	232.4	255.3	287.6
ANNUAL CHANGE							
Total Operating Revenue	%	14.2	19.9	21.4	15.5	1.3	1.5
GNP (Current $)	%	10.5	13.8	12.2	14.3	5.2	9.0
Personal Disposable Income	%	12.9	12.7	13.3	16.5	9.9	12.7
RATIO							
TOR/GNP (Current $)	%	1.00	1.05	1.14	1.15	1.11	1.03

(e) Estimated

Sources:
(1) Aviation Statistics Centre - Statement 3 - Unit Toll Services and Statement 4 - Charter and Contract Flying Services - 1983 Preliminary.
(2) Research Branch, CTC, "Equipment and Fleet Planning in the Canadian Airline Industry", August 1982, WP No. 10-82-05.
(3) Statistics Canada Publications, Catalogue No. 11-003E, 13-004E, 13-201, 51-206.
(4) Wardair International Report 1983.

APPENDIX 1

LEVEL I AIRLINES VS. ECONOMY

TABLE A.1.2

YIELDS AND PRICE INDICES

		1978	1979	1980	1981	1982	1983
LEVEL I AIRLINES							
Total Operating Revenue (TOR)	($M)	2 323	2 784	3 381	3 906	3 957	4 015 (e)
Revenue Ton Miles (RTM)	(Mil)	2 892	3 324	3 454	3 430	3 316	3 305 (e)
Yield (TOR/RTM)	(¢)	80.3	83.8	97.9	113.9	119.3	121.5 (e)
ECONOMY							
CPI - Overall (1971=100)		175	191	211	237	263	278
CPI - Transport Component (1971=100)		162	178	201	238	271	285
ANNUAL CHANGE							
Yield (TOR/RTM)	%	4.2	4.4	16.8	16.3	4.7	1.8
CPI - Overall	%	8.7	9.1	10.5	12.3	11.0	5.7
CPI - Transport Component	%	5.9	9.9	12.9	18.4	13.9	5.2

(e) Estimated

PASSENGER FARES

		1978	1979	1980	1981	1982	1983
LEVEL I AIRLINES							
Total Passenger Revenue (TPR)	($M)	1 957	2 330	3 084	3 335	3 359	3 380 (e)
Revenue Passenger Miles (RPM)	(Bil)	23.67	27.34	28.60	28.01	26.73	26.10 (e)
Passenger Yield (TPR/RPM)	(¢)	8.27	8.52	10.78	11.91	12.57	12.95 (e)
ECONOMY							
Air Fare Component of CPI (1971=100)		172	180	227	270	334	357
Economy Fare (750 miles) (1971=100)		164	173	204	243	287	298 (e)
ANNUAL CHANGE							
Passenger Yield (TPR/RPM)	%	4.0	3.0	26.5	10.5	5.5	3.0
Air Fare Component of CPI	%	3.6	4.7	26.1	18.9	23.7	6.9
Economy Fare (750 miles)	%	3.8	5.5	17.9	19.1	18.1	3.8
SELECTED INDICES (1978=1.00)							
Economy Fare (750 miles)		1.00	1.06	1.24	1.48	1.76	1.83
Passenger Yield		1.00	1.03	1.22	1.44	1.52	1.57
Consumer Price Index - Overall		1.00	1.13	1.26	1.44	1.51	1.59

(e) Estimated

Sources:
(1) Aviation Statistics Centre - Statement 3 - Unit Toll Services and Statement 4 - Charter and Contract Flying Services - 1983 Preliminary.
(2) Research Branch, CTC, "Inflation and the Canadian Airline Industry", December 1982, WP No. 40-82-10.
(3) Statistics Canada Publications, Catalogue No. 51-206, No. 62-010.
(4) Tariffs filed with the Air Transport Committee - 1983 Estimated.
(5) Wardair International Annual Report 1983.

APPENDIX 1

LEVEL I AIRLINES VS. ECONOMY

TABLE A.1.3

INPUTS, OUTPUTS AND EFFICIENCY

		1978	1979	1980	1981	1982	1983
LEVEL I AIRLINES							
PHYSICAL INPUTS							
Gallons of Fuel Consumed	MIL	713.4	797.2	796.6	788.0	736.4	682.0
Average Number of Employees	000	35.33	37.80	40.52	41.16	40.06	36.99
OUTPUTS							
(Maximum) Payload Ton Miles	MIL	6 136	6 928	7 096	7 372	7 307	6 930
EFFICIENCY							
(Maximum) Payload Ton Miles/Gallons of Fuel Consumed		8.60	8.69	8.91	9.36	9.92	10.16
(Maximum) Payload Ton Miles/Average Number of Employees	000	174	183	175	179	182	187
INDICES (1978=1.00)							
(Maximum) Payload Ton Miles/Gallons of Fuel Consumed		1.00	1.01	1.04	1.09	1.15	1.18
(Maximum) Payload Ton Miles/Average Number of Employees		1.00	1.05	1.01	1.03	1.05	1.07
ECONOMY							
PHYSICAL INPUT							
Labour Force	MIL	9.99	10.40	10.71	11.01	10.64	10.73
OUTPUT							
Gross National Product (Constant 1971 $)	$BIL	126.3	130.4	131.7	136.1	130.1	134.1
EFFICIENCY							
Gross National Product/Labour Force	$000	12.64	12.54	12.30	12.36	12.23	12.50
INDEX (1978=1.00)							
Gross National Product/Labour Force		1.00	.99	.97	.98	.97	.99

Sources: (1) Aviation Statistics Centre - Statements 3 and 4, and Statement 32(I,II,III) - Fuel, Oil, and Employment Report - 1983 Preliminary.
(2) Statistics Canada Publications, Catalogue No. 11-003E, 15-004E.

APPENDIX 1

4 MAJOR AIRLINES VS. LEVEL I AIRLINES

TABLE A.1.4

OPERATING REVENUES (1982)

($ Millions)

	STATISTICS CANADA (Air Carrier)(1)	ANNUAL REPORTS (Consolidated)(2)	USED IN THE REPORT			
			OPERATIONAL(3) ANALYSIS	% OF TOTAL	FINANCIAL(4) ANALYSIS	% OF TOTAL
AIR CANADA	2 171	2 306	2 171	54.9	2 306	56.1
CP AIR	849	851	849	21.4	851	20.7
PWA	315	319	315	8.0	319	7.8
WARDAIR	271	346	346	8.7	346	8.4
4 MAJOR AIRLINES	3 606	3 822	3 681	93.0	3 822	93.0
NORDAIR	113	125	113	2.9	125	3.0
EPA	93	150	93	2.3	93	2.3
QUEBECAIR	70	84(e)	70	1.8	70	1.7
EASTERN REGIONAL SUB-TOTAL	276	359	276	7.0	288	7.0
LEVEL I TOTAL	3 882	4 181	3 957	100.0	4 110	100.0

Sources: (1) Aviation Statistics Centre - Statement 21 - Statement of Income.
(2) Airlines' Annual Report, 1982.
(3) Values consistent with data used in sections 3 through 6 of the report.
(4) Values consistent with data used in section 7 of the report.
(e) Estimated.

APPENDIX 2

Airline Fleet Plans in 1983 Annual Reports
Air Canada, CP Air, PWA, Nordair, Wardair (1982)

APPENDIX 2

AIRLINE FLEET PLANS IN 1983 ANNUAL REPORTS
AIR CANADA, CP AIR, PWA, NORDAIR, WARDAIR (1982)

AIR CANADA 1983

"THE FLEET. Air Canada's new, state-of-the-art Boeing 767 was introduced successfully to North American services, phasing out the fleet of DC-8 passenger aircraft. Capable of carrying 201 passengers, the 767 provides more passenger convenience with wide-body features such as twin aisles and overhead storage compartments.

Only four of the seven Boeing 747's, of which two are in the passenger/cargo (Combi) configuration, were retained year-round in Air Canada service. Two of these, outfitted with sleeperette seats, were used for transatlantic service, one similarly modified was assigned to a Los Angeles/Toronto/Europe service; and the fourth with an all-economy configuration was used for charters. The remaining three aircraft were either in desert storage in the United States or were on lease.

All of the 13 DC-8 passenger aircraft owned at year-end, and five of the 12 DC-8 cargo aircraft are in storage in the United States and available for sale or lease, with one demonstrator located in Dorval. A program of re-engining six of the fleet of seven DC-8 freighters was commenced in 1983, for completion by the end of 1984 and will result in significant fuel savings. The program is being carried out by Air Canada maintenance and engineering staff at the Dorval Technical Centre, and an active marketing program is underway to attract other DC-8 users to the company's re-engining facility, and to enhance the sales potential of the surplus of DC-8 aircraft.

The DC-9 fleet was reduced by two aircraft during the year, with one being sold, and one destroyed following an emergency landing and fire in Cincinnati in June. The interior re-configuration of the entire DC-9 fleet was completed early in 1983 and the program for engine modification continued, resulting in 60 per cent of the fleet being modified by year-end. The result is an aircraft with increased fuel efficiency, which is quieter and more aesthetically pleasing for greater customer comfort and convenience.

The Lockheed 1011's have taken on a changing role within the airline. Domestically, they have been replaced on some transcontinental routes by the 767's as the proliferation of carriers on major routes has resulted in greater need for frequency rather than size. The L-1011 has replaced the DC-8 on international services. It is seeing greater utilization to the Caribbean and between Atlantic Canada and the United Kingdom. Six L-1011 aircraft equipped with sleeperettes and business cabins were used for Atlantic service.

The Boeing 727 continued to fill the needs between the DC-9 and the 767. Seven aircraft in all-economy configuration were pressed into greater service on Montreal/Ottawa and Toronto/Ottawa Rapidair schedules with the retirement of the DC-8's.

At year-end, aircraft actively deployed totalled 108, consisting of four 747's, eighteen L-1011's, five 767's, thirty-nine 727's, thirty-five DC-9's, and seven DC-8 freighters. Owned but not in service were three 747's, eighteen DC-8's, and one 767 delivered in December.

With the current fleet mix, Air Canada is capable of maintaining present levels of service and of adapting to changing roles. The L-1011 and the 767 have respectively become the backbone of the international and domestic services, while earlier members of the fleet continue to provide the flexibility to meet demands in all segments of a diversified market.

CP AIR 1983

Fleet Plan

At the end of 1982, CP Air had planned to take delivery, between December 1984 and June 1985, of four new-generation Boeing 767 aircraft. This plan was predicated on assumptions of the late 1970's that operating earnings and airline traffic would continue to grow at levels of 8 to 10% per year. These assumptions proved to be overly optimistic, as the world economy proceeded to enter an extended recessionary period and demand for airline services declined.

Therefore, in 1983, in order to better achieve our overall marketing and operating objectives, CP Air cancelled the purchase of the Boeing 767 aircraft and instead ordered ten B-737-300 aircraft. The delivery schedule has been stretched over four years, beginning in 1985, thereby minimizing immediate capital requirements. In addition, the B-737-300 aircraft will provide CP Air with 50% more seat capacity than the B-767's, but with more flexibility to deploy that capacity over smaller markets. This approach complements the airline's new "hub-and-spoke" network introduced in 1983. The B-737-300 also employs most of the new technology that the B-767 offers, plus 35% greater fuel efficiency than our present B-737-200 aircraft. Furthermore, it puts us in the desirable position of operating a fleet limited to three aircraft types, thus reducing our parts inventory and training costs.

In 1983 CP Air entered a two-year lease agreement with United Airlines to exchange three of our long-range DC-10-30s for three of their shorter-range DC-10-10s, with provision to extend the exchange for a total of four years. The Corporation gains considerably from the arrangement by receiving net lease payments of $8.0 million a year, as well as achieving operational savings from using the lighter weight DC-10-10s on domestic routes.

Also during 1983, CP Air took delivery of two new Boeing 737-200 aircraft and sold two of its older Boeing 737s. The Corporation also sold its four remaining DC-8-63s and one Boeing 727, the former having been taken

out of service in 1982 and the latter in 1981. The one remaining Boeing 727, presently on lease, is scheduled to be sold in March 1984.

CP Air's fleet, with an average age of just over five years, remains one of the most modern and fuel-efficient in the airline industry. Because of this advantage, CP Air experiences fewer schedule disruptions due to mechnical problems, plus ongoing savings in aircraft overhaul and maintenance expenses. By carefully matching our aircraft to our routes and schedules, and by modifying and upgrading the fleet generally, CP Air has continued to realize fuel savings. As an example, two DC-10 modifications begun in 1983 will improve fuel consumption by 1.6% which, by 1985, when all aircraft have been refitted, will result in annual fuel savings of $1.8 million. The Corporation will continue to examine all possible future economies in this area.

PWA 1983

Building For The Future

Pacific Western owns twenty-six jet and two turbo-prop aircraft, and will take delivery of two new Boeing 767 aircraft in late 1986 and early 1987. Sixteen aircraft have been acquired since January 1, 1979, including the two Boeing 767's. The average age of the operating fleet is approximately five years.

At December 31, 1983, Pacific Western operated eighteen Boeing 737's, two Boeing 767's, one Boeing 727 and one Lockheed Hercules. Five Boeing 737's were leased out during 1983 and are being operated by America West Airlines. Upon termination of the five year leases, Pacific Western will have the opportunity to return the aircraft to its operating fleet. In addition, one Lockheed Hercules was leased out for a one year period in October 1983, and two Boeing 737 C model aircraft will be leased out for a five month period during the summer of 1984.

NORDAIR 1983

Airlines Operations

At the end of 1983, Nordair's fleet consisted of nine Boeing 737 aircraft, five Fairchild FH-227s and two Lockheed Electra L-188s. In addition, the Corporation leased a Boeing 737 from Sabena World Airlines for a period of seven months, ending in April 1984.

The Boeing 737 fleet was reduced from eleven to nine during the year. One Boeing 737, sold in late 1981, was delivered to Guinness Peat Aviation in March and another was delivered in November. These changes did not affect the versatility of Nordair's 737 fleet. Six of the nine aircraft are of passenger/cargo type equipped for gravel runways while three are regular passenger aircraft. Five of them have long-range capability and one is equipped for over-water flights. The average age of the fleet is 8.2 years.

The FH-227 fleet comprises two passenger/cargo combi aircraft, used exclusively under contract on the DEWline (Distant Early Warning Line), and three passenger aircraft used for scheduled services in Quebec and Ontario.

Two Douglas DC-8-52 aircraft, inactive since the end of 1981, were sold. ...

As part of a progressive fleet refurbishing and refinishing program, one Boeing 737 appeared in the new livery in December, with a second and third aircraft to follow in February and May 1984 respectively. Plans were also completed to install wide-body interiors in four of the Boeing 737 combi aircraft, with the first and second installations to be completed in February and May 1984. Two more installations are planned for 1985.

WARDAIR 1982

Facilities and Equipment

As a result of the continuing uncertainty in both the economic and regulatory environments, Wardair has negotiated a postponement in the delivery of the six Airbus A310 aircraft previously scheduled for delivery commencing in the fall of 1983. We will re-evaluate our future fleet requirements as conditions become more favourable."

APPENDIX 3

Passenger Services - 4 Major Airlines

Table A.3.1 Air Canada's Domestic Economy Fare Formula 1978-83
Table A.3.2 Passenger Fare Dilution 1978-83

APPENDIX 3

PASSENGER SERVICES - 4 MAJOR AIRLINES

TABLE A.3.1

AIR CANADA'S DOMESTIC ECONOMY FARE FORMULA
1978-1983

Year	Effective Date	Formula: Start-up ($/Pass)	Formula: Cents per mile (¢/RPM)	Applied from - to	% of year	Weighted*: $/Pass	Weighted*: ¢/RPM
1978	Mar. 77	27.82	8.00	Jan. - Mar.	25.0	6.95	2.00
	Apr. 78	29.50	8.25	Apr. - Dec.	75.0	22.10	6.20
					100.0	29.05	8.20
1979	Jan. 79	31.00	8.66	Jan. -Sept.	75.0	23.25	6.50
	Oct.	33.50	8.83	Oct. - Dec.	25.0	8.40	2.20
					100.0	31.65	8.70
1980	Oct. 79	33.50	8.83	Jan. - Feb.	16.7	5.60	1.45
	Mar. 80	36.70	9.67	Mar. - May	25.0	9.20	2.40
	June	39.70	9.67	June - July	16.7	6.65	1.60
	Aug.	39.90	9.75	Aug. - Sept.	16.7	6.65	1.65
	Oct.	41.10	10.04	October	8.2	3.40	.85
	Nov.	41.30	10.15	Nov. - Dec.	16.7	6.90	1.70
					100.0	38.40	9.65
1981	Jan. 81	45.20	11.11	Jan. - Feb.	16.7	7.55	1.85
	Mar.	45.40	11.24	Mar. - Apr.	16.7	7.60	1.90
	May	45.40	11.54	May	8.3	3.75	.95
	June	45.85	11.79	June - Aug.	25.0	11.45	2.95
	Sept.	50.00	12.35	Sept. - Dec.	33.3	16.65	4.10
					100.0	47.00	11.75
1982	Jan. 82	54.75	13.52	Jan. - Feb.	16.7	9.15	2.25
	Mar.	55.30	13.83	Mar. - Sept.	58.3	32.25	8.05
	Oct.	58.65	14.70	Oct. - Dec.	25.0	14.65	3.70
					100.0	56.05	14.00
1983	Oct. 82	58.65	14.70	Jan. - Feb.	16.7	9.80	2.45
	Mar. 83	59.20	15.01	Mar. - Sept.	58.3	34.50	8.75
	Oct.	62.16	15.76	Oct. - Dec.	25.0	15.55	3.95
					100.0	59.85	15.15

* The start-up and cents per mile portions of the fare are weighted for the year by their effective dates.

Note: Air Canada follows the standard format established by the Air Transport Committee (ATC) in October 1980 with respect to the tariff for domestic passenger economy fares. The entries shown prior to October 1980 are shown as submitted by Air Canada together with a support package somewhat less formal than the standard format.

Source: Tariffs filed with the Air Transport Committee.

APPENDIX 3

PASSENGER SERVICES - 4 MAJOR AIRLINES

TABLE A.3.2

PASSENGER FARE DILUTION 1978-1983

		1978	1979	1980	1981	1982	1983
ACTUAL REVENUE	($M)						
Air Canada[1]		1 133	1 365	1 643	1 857	1 861	1 844
CP Air[2]		368	418	522	640	655	662
PWA[2]		110	139	175	225	227	224
Wardair[3]		118	178	234	256	280	291
REVENUE PASSENGERS CARRIED	(Mil)						
Air Canada[1]		11.3	12.8	13.1	12.5	11.4	10.5
CP Air[2]		2.76	3.02	3.34	3.52	3.29	3.27
PWA[2]		2.78	3.30	3.66	3.79	3.14	2.93
Wardair[3]		.76	1.11	1.28	1.25	1.38	1.48
REVENUE PASSENGER MILES	(Mil)						
Air Canada[1]		12 562	14 628	15 176	14 351	13 590	12 728
CP Air[2]		4 741	5 195	5 797	5 992	5 531	5 735
PWA[2]		728	846	927	1 047	928	895
Wardair[3]		2 360	3 387	3 798	3 517	3 844	3 851
START-UP CHARGE	($/PASS.)	29.05	31.65	38.40	47.00	56.05	59.85
CENTS PER MILE CHARGE	(c/RPM)	8.20	8.70	9.65	11.75	14.00	15.15
THEORETICAL REVENUE[4]	($M)						
Air Canada[1]		1 358	1 678	1 968	2 274	2 542	2 557
CP Air[2]		469	548	688	870	959	1 065
PWA[2]		141	178	230	301	306	311
Wardair[3]		216	330	416	472	616	672
PASSENGER FARE DILUTION[5]	(%)						
Air Canada		83.4	81.3	83.5	81.7	73.2	72.1
CP Air		78.5	76.3	75.9	73.6	68.3	62.2
PWA		78.0	78.1	76.1	74.8	74.2	72.0
Wardair		54.6	53.9	56.3	54.2	45.5	43.3

1 System Passenger Revenue.
2 Scheduled Passenger Revenue.
3 Charter Revenue Excluding Tours - Estimated.
4 Defined as: (Start-up Charge x Number of Passengers Carried) + (Cents per Mile x Revenue Passenger Miles).
5 Defined as: Actual Revenue ÷ Theoretical Revenue.

Sources: (1) Airlines Annual Reports, 1982-1983.
(2) Tariffs filed with the Air Transport Committee.

APPENDIX 4

Financial Analysis - 4 Major Airlines 1978-83

Table A.4.1 Air Canada: Capacity and Capital Accounting
Table A.4.2 Air Canada: Income, Returns, Balance Sheet
Table A.4.3 CP Air: Capacity and Capital Accounting
Table A.4.4 CP Air: Income, Returns, Balance Sheet
Table A.4.5 PWA: Capacity and Capital Accounting
Table A.4.6 PWA: Income, Returns, Balance Sheet
Table A.4.7 Wardair: Capacity and Capital Accounting
Table A.4.8 Wardair: Income, Returns, Balance Sheet

APPENDIX 4

FINANCIAL ANALYSIS

TABLE A.4.1

CAPACITY AND CAPITAL ACCOUNTING

AIRLINE: AIR CANADA

FLEET (number of aircraft)		1978	1979	1980	1981	1982	1983
At beginning of year		109	108	117	126	127	128
plus aircraft added		1	11	9	8	5	4
less aircraft retired		(2)	(2)	-	(7)	(4)	(2)
less aircraft inactive[1]		(2)	(2)	(2)	(2)	(13)	(22)
Aircraft active at year end		106	115	124	125	115	108
CAPACITY - PAYLOAD TONS (PT)							
Total at year end		2 811	3 050	3 230	3 456	3 528	3 636
less inactive[1]		86	86	86	86	503	821
Active at year end		2 725	2 964	3 144	3 370	3 025	2 815
Ratio							
PT active/Total PT	(%)	97	97	97	98	86	77
PROPERTY AT COST (at year end)	($M)						
Flight equipment - active(e)		1 094	1 279	1 447	1 838	1 892	1 996
Flight equipment - inactive(e)		42	42	42	42	180	286
Other property and equipment		359	369	414	467	518	580
Progress payments (PP)		53	86	134	99	117	149
Total including progress payments		1 548	1 776	2 037	2 446	2 707	3 011
ACCUMULATED DEPRECIATION (at year end)	($M)						
Flight equipment(e)		589	658	742	781	863	935
Other property and equipment(e)		175	200	215	255	285	318
Total		764	858	957	1 036	1 148	1 253
CAPITAL CHANGES	($M)						
Capital Expenditures		71	270	286	472	305	344
Retirements at cost - inferred[2]		16	42	25	63	44	40
Depreciation and amortization expense		108	113	128	131	153	144
Depreciation adjustments		18	19	29	52	41	39
Average property at cost (excl. PP)		1 483	1 593	1 797	2 125	2 469	2 726
Dep'n and amort./Ave. property at cost (excl. PP)	(%)	7.3	7.1	7.1	6.2	6.2	5.3
Gain on disposals of property and equipment		8.8	1.5	12.0	7.4	24.1	18.5
Proceeds on disposals of property and equipment		10.5	2.7	13.7	18.2	32.0	20.2
Funds from operations		188	209	220	223	118	85
CASH GENERATION MARGIN[3]	(%)	15.1	13.3	12.3	10.7	6.5	4.6

[1] Inactive aircraft includes aircraft leased to others, as well as, aircraft owned or leased by the airline but not used.

[2] Capital expenditures for the year less the increase in total property at cost (including progress payments) from prior year end total.

[3] Funds from operations, including proceeds on disposals of property and equipment, as a percentage of total operating revenues.

(e) Estimated

Source: Air Canada Annual Reports, 1978-1983.

APPENDIX 4

FINANCIAL ANALYSIS

TABLE A.4.2

INCOME, RETURNS AND BALANCE SHEET

AIRLINE: AIR CANADA

INCOME AND EARNINGS	($M)	1978	1979	1980	1981	1982	1983
Operating revenue (OR)		1 322	1 595	1 906	2 258	2 306	2 298
Operating expenses (OE)		1 238	1 494	1 816	2 185	2 332	2 270
Operating income (OI)		84	101	90	73	(26)	28
Non-operating income - net		-	1	15	2	(9)	(27)
Income before income taxes (IBT)		84	102	105	75	(35)	1
Extraordinary items		-	-	-	-	(17)	(2)
Provision for income taxes		37	47	48	35	(19)	(5)
Net income (NI)		47	55	57	40	(33)	4
Dividends		-	13	13	13	13	-
Ratios							
Operating margin (OI/OR)	(%)	6.4	6.3	4.7	3.2	(1.1)	1.2
Profit margin (IBT/OR)	(%)	6.4	6.4	5.5	3.3	(1.5)	-
Net income margin (NI/OR)	(%)	3.6	3.4	3.0	1.8	(1.4)	.2
RETURNS	($M)						
Interest expense (IE)		46	46	44	55	63	80
Average equity (AE)		230	436	479	514	505	484
Average long term debt (ALTD)		759	603	623	672	801	992
Ratios							
Return on equity (NI/AE)	(%)	20.4	12.6	11.9	7.8	(6.5)	.8
Return on investment ((NI+IE)/(AE+ALTD))	(%)	9.4	9.7	9.2	8.0	2.3	5.7
Investment turnover (OR/(AE+ALTD))		1.34	1.54	1.73	1.90	1.77	1.56
Interest on long term debt/operating revenue	(%)	3.5	2.9	2.3	2.4	2.7	3.5
BALANCE SHEET	($M)						
ASSETS							
Current assets		544	560	565	411	432	368
Net book value[1]		784	918	1 080	1 410	1 559	1 758
Other assets		5	28	43	49	50	65
Total assets		1 333	1 506	1 688	1 870	2 041	2 191
LIABILITIES							
Current liabilities (excl. current portion of LTD)		245	291	360	399	467	417
Long term debt (incl. current portion of LTD)		592	613	633	710	892	1 092
Other liabilities (incl. deferred taxes)		81	145	194	233	200	196
Equity		415	457	501	528	482	486
Ratios							
NBV/Total assets	(%)	59	61	64	75	76	80
LTD/Capital	(%)	59	57	56	57	65	69
Excess (shortfall) of cash	($M)						
Current assets - Current liabilities		299	269	205	12	(35)	(49)

[1] Total property at cost including progress payments less accumulated depreciation.

Source: Air Canada Annual Reports, 1978-1983.

APPENDIX 4

FINANCIAL ANALYSIS

TABLE A.4.3

CAPACITY AND CAPITAL ACCOUNTING

AIRLINE: CP AIR

FLEET (number of aircraft)		1978	1979	1980	1981	1982	1983
At beginning of year		25	24	31	30	34	33
plus aircraft added		-	7	2	8	6	2
less aircraft retired		(1)	-	(3)	(4)	(7)	(3)
less aircraft inactive[1]		-	-	-	(2)	(2)	(1)
Aircraft active at year end		24	31	30	32	31	31
CAPACITY - PAYLOAD TONS (PT)							
Total at year end		784	968	1 006	1 106	1 090	1 049
less inactive[1]		-	-	-	40	40	20
Active at year end		784	968	1 006	1 066	1 050	1 029
Ratio							
PT active/Total PT	(%)	100	100	100	96	96	98
PROPERTY AT COST (at year end)	($M)						
Flight equipment - active(e)		318	497	584	789	945	980
Flight equipment - inactive(e)		-	-	-	23	23	8
Other property and equipment		81	93	107	131	151	173 [2]
Progress payments (PP)		10	10	44	17	26	29
Total including progress payments		409	600	735	960	1 145	1 190
ACCUMULATED DEPRECIATION (at year end)	($M)						
Flight equipment(e)		167	192	207	239	265	285
Other property and equipment(e)		34	38	44	51	62	75
Total		201	230	251	290	327	360
CAPITAL CHANGES	($M)						
Capital Expenditures		21	193	153	242	230	58
Retirements at cost - inferred[3]		12	2	18	17	45	13
Depreciation and amortization expense		25	29	40	56	76	61
Depreciation adjustments		10	-	19	17	39	28
Average property at cost (excl. PP)		399	495	641	817	1 031	1 140
Dep'n and amort./Ave. property at cost (excl. PP)	(%)	6.3	5.9	6.2	6.9	7.4	5.4
Gain on disposals of property and equipment		3.7	.2	.6	.8	25.8	19.2
Proceeds on disposals of property and equipment		3.8	.4	.6	.9	38.3	25.4
Funds from operations		48	55	53	27	(14)	21
CASH GENERATION MARGIN[4]	(%)	11.2	10.1	7.9	3.4	2.8	5.2

1 Inactive aircraft includes aircraft leased to others, as well as, aircraft owned or leased by the airline but not used.

2 Excludes CP Hotels valued at $297 M.

3 Capital expenditures for the year less the increase in total property at cost (including progress payments) from prior year end total.

4 Funds from operations, including proceeds on disposals of property and equipment, as a percentage of total operating revenues.

(e) Estimated

Source: CP Air Annual Reports, 1978-1983.

APPENDIX 4

FINANCIAL ANALYSIS

TABLE A.4.4

INCOME, RETURNS AND BALANCE SHEET

AIRLINE: CP AIR

INCOME AND EARNINGS	($M)	1978	1979	1980	1981	1982	1983
Operating revenue (OR)		466	544	684	814	851	865
Operating expenses (OE)		422	511	662	817	877	867
Operating income (OI)		44	33	22	(3)	(26)	(2)
Non-operating income - net		(4)	(6)	(11)	(26)	(39)	(21)
Income before income taxes (IBT)		40	27	11	(29)	(65)	(23)
Extraordinary items		-	-	-	-	-	(1)
Provision for income taxes		19	11	4	(12)	(30)	(11)
Net income (NI)		21	16	7	(17)	(35)	(13)
Dividends		1	3	4	5	5	3
Ratios							
Operating margin (OI/OR)	(%)	9.4	6.1	3.2	(.4)	(3.1)	(.2)
Profit margin (IBT/OR)	(%)	8.6	5.0	1.6	(3.6)	(7.6)	(2.7)
Net income margin (NI/OR)	(%)	4.5	2.9	1.0	(2.1)	(4.1)	(1.5)
RETURNS	**($M)**						
Interest expense (IE)		11	15	22	38	57	39
Average equity (AE)		40	81	100	100	89	208
Average long term debt (ALTD)		140	182	279	415	576	565
Ratios							
Return on equity (NI/AE)	(%)	52.5	19.8	7.0	(17.0)	(39.3)	(6.3)
Return on investment ((NI+IE)/(AE+ALTD))	(%)	17.8	11.8	7.7	4.1	3.3	3.4
Investment turnover		2.59	2.07	1.81	1.58	1.28	1.12
Interest on long term debt/operating revenue	(%)	2.4	2.8	3.2	4.7	6.7	4.5
BALANCE SHEET	**($M)**						
ASSETS							
Current assets		148	141	147	149	105	130
Net book value[1]		208	370	484	670	818	1 035
Other assets		-	2	9	9	19	7
Total assets		356	513	640	828	942	1 172
LIABILITIES							
Current liabilities (excl. current portion of LTD)		144	158	182	207	215	266
Long term debt (incl. current portion of LTD)		131	232	326	503	648	482
Other liabilities (incl. deferred taxes)		16	25	31	19	-	88
Equity		65	98	101	99	79	336
Ratios							
NBV/Total assets	(%)	58	72	76	81	87	88
LTD/Capital	(%)	67	70	76	84	89	59
Excess (shortfall) of cash	**($M)**						
Current assets - Current liabilities		4	(17)	(35)	(58)	(110)	(136)

[1] Total property at cost including progress payments less accumulated depreciation.

Source: CP Air Annual Reports, 1978-1983.

APPENDIX 4

FINANCIAL ANALYSIS

TABLE A.4.5

CAPACITY AND CAPITAL ACCOUNTING

AIRLINE: PWA

FLEET (number of aircraft)		1978	1979	1980	1981	1982	1983
At beginning of year		29	26	23	25	29	27
plus aircraft added		1	2	4	5	2	2
less aircraft retired		(4)	(5)	(2)	(1)	(4)	(1)
less aircraft inactive[1]		-	-	-	(1)	(3)	(6)
Aircraft active at year end		26	23	25	28	24	22
CAPACITY - PAYLOAD TONS (PT)							
Total at year end		417	390	422	478	446	498
less inactive[1]		-	-	-	15	56	104
Active at year end		417	390	422	463	390	394
Ratio							
PT active/Total PT	(%)	100	100	100	97	87	79
PROPERTY AT COST (at year end)	($M)						
Flight equipment - active(e)		155	162	213	289	284	361
Flight equipment - inactive(e)		-	-	-	5	20	38
Other property and equipment		21	23	30	48	73	60
Progress payments (PP)		5	24	26	20	*	*
Total including progress payments		181	209	269	362	377	459
ACCUMULATED DEPRECIATION (at year end)	($M)						
Flight equipment(e)		29	35	36	50	51	66
Other property and equipment(e)		7	7	9	11	12	11
Total		36	42	45	61	63	77
CAPITAL CHANGES	($M)						
Capital expenditures		25	48	73	100	71	122
Retirements at cost - inferred[3]		21	20	13	7	56	40
Depreciation and amortization expense		9	9	11	14	15	20
Depreciation adjustments		11	3	8	(2)	13	6
Average property at cost (excl. PP)		176 [2]	181	214	293	360	418
Dep'n and amort./Ave. property at cost (excl. PP)	(%)	5.1	5.0	5.1	4.8	4.2	4.8
Gain on disposals of property and equipment		3.0	3.8	2.7	3.9	15.1	8.6
Proceeds on disposals of property and equipment		8.4	20.0	8.0	6.2	42.1	17.8
Funds from operations		15	19	29	39	25	35
CASH GENERATION MARGIN[4]	(%)	12.9	19.2	15.2	14.4	21.0	16.2

[1] Inactive aircraft includes aircraft leased to others, as well as, aircraft owned or leased by the airline but not used.
[2] Represents 1978 year end value.
[3] Capital expenditures for the year less the increase in total property at cost (including progress payments) from prior year end total.
[4] Funds from operations, including proceeds on disposals of property and equipment, as a percentage of total operating revenues.

* Progress payments included in property at cost.

(e) Estimated

Source: PWA Annual Reports, 1978-1983.

APPENDIX 4

FINANCIAL ANALYSIS

TABLE A.4.6

INCOME, RETURNS AND BALANCE SHEET

AIRLINE: PWA

INCOME AND EARNINGS	($M)	1978	1979	1980	1981	1982	1983
Operating revenue (OR)		178	203	243	313	319	328
Operating expenses (OE)		166	189	224	287	294	301
Operating income (OI)		12	14	19	26	25	27
Non-operating income - net		-	19	19	25	9	1
Income before income taxes (IBT)		12	33	38	51	34	28
Extraordinary items		(3)	(14)	(17)	(22)	(18)	(12)
Provision for income taxes		1	6	9	11	10	5
Net income (NI)		8	13	12	18	6	11
Dividends		-	-	-	-	-	-
Ratios							
Operating margin (OI/OR)	(%)	6.7	6.9	7.8	8.3	7.8	8.2
Profit margin (IBT/OR)	(%)	6.7	16.3	15.6	16.3	10.7	8.5
Net income margin (NI/OR)	(%)	4.5	6.4	4.9	5.8	1.9	3.4
RETURNS	($M)						
Interest expense (IE)[1]		7	21	22	28	23	21
Average equity (AE)		32	42	55	70	82	140
Average long term debt (ALTD)[2]		182	282	284	279	259	272
Ratios							
Return on equity (NI/AE)	(%)	25.0	31.0	21.8	25.7	7.3	7.9
Return on investment ((NI+IE)/(AE+ALTD))	(%)	7.0	10.5	10.0	13.2	8.5	7.8
Investment turnover		.83	.63	.72	.90	.94	.80
Interest on long term debt/operating revenue	(%)	3.9	8.6	9.1	8.9	7.2	3.5
BALANCE SHEET	($M)						
ASSETS							
Current assets		213	193	180	142	124	136
Net book value[3]		145	167	224	301	314	382
Other assets		4	5	4	6	7	28
Total assets		362	365	408	449	445	546
LIABILITIES							
Current liabilities (excl. current portion of LTD)		38	41	43	83	80	59
Long term debt (incl. current portion of LTD)[2]		288	275	292	265	252	291
Other liabilities (incl. deferred taxes)		-	-	12	22	28	-
Equity		36	49	61	79	85	196
Ratios							
NBV/Total assets	(%)	40	46	55	67	71	70
LTD/Capital	(%)	89	85	83	77	75	60
Excess (shortfall) of cash	($M)						
Current assets - Current liabilities		175	152	137	59	44	77

1 Includes dividends paid on preferred shares.
2 Includes preferred shares from a subsidiary company.
3 Total property at cost including progress payments less accumulated depreciation.

Source: PWA Annual Reports, 1978-1983.

APPENDIX 4

FINANCIAL ANALYSIS

TABLE A.4.7

CAPACITY AND CAPITAL ACCOUNTING

AIRLINE: WARDAIR

FLEET (number of aircraft)		1978	1979	1980	1981	1982	1983
At beginning of year		4	6	6	6	7	7
plus aircraft added		3	1	-	1	-	-
less aircraft retired		(1)	(1)	-	-	-	-
less aircraft inactive[1]		-	-	-	-	-	-
Aircraft active at year end		6	6	6	7	7	7
CAPACITY - PAYLOAD TONS (PT)							
Total at year end		379	434	434	486	486	486
less inactive[1]		-	-	-	-	-	-
Active at year end		379	434	434	486	486	486
Ratio							
PT active/Total PT	(%)	100	100	100	100	100	100
PROPERTY AT COST (at year end)	($M)						
Flight equipment - active(e)		243	271	268	321	326	329
Flight equipment - inactive(e)		-	-	-	-	-	-
Other property and equipment		17	18	36	37	52	53
Progress payments (PP)		-	-	-	28	-	-
Total including progress payments		260	289	304	386	378	382
ACCUMULATED DEPRECIATION (at year end)	($M)						
Flight equipment(e)		25	35	51	69	87	107
Other property and equipment(e)		2	3	4	5	7	8
Total		27	38	55	74	94	115
CAPITAL CHANGES	($M)						
Capital expenditures		191	39	21	84	11	3
Retirements at cost - inferred[2]		13	10	6	2	19	(1)
Depreciation and amortization expense		9	17	18	20	21	24
Depreciation adjustments		6	6	1	1	1	3
Average property at cost (excl. PP)		171	275	297	331	368	380
Dep'n and amort./Ave. property at cost (excl. PP)	(%)	5.3	6.2	6.1	6.0	5.7	6.3
Gain on disposals of property and equipment		11	5	2	(1)	-	-
Proceeds on disposals of property and equipment		18	11	7	3	-	-
Funds from operations		4	8	46	19	3	30
CASH GENERATION MARGIN[3]	(%)	14.2	8.8	17.7	7.0	.9	8.2

[1] Inactive aircraft includes aircraft leased to others, as well as, aircraft owned or leased by the airline but not used.
[2] Capital expenditures for the year less the increase in total property at cost (including progress payments) from prior year end total.
[3] Funds from operations, including proceeds on disposals of property and equipment, as a percentage of total operating revenues.

(e) Estimated

Source: Wardair International Annual Reports, 1978-1983.

APPENDIX 4

FINANCIAL ANALYSIS

TABLE A.4.8

INCOME, RETURNS AND BALANCE SHEET[1]

AIRLINE: WARDAIR

	($M)	1978	1979	1980	1981	1982	1983
INCOME AND EARNINGS							
Operating revenue (OR)		155	215	299	315	346	365
Operating expenses (OE)		150	203	249	286	339	338
Operating income (OI)		5	12	50	29	7	27
Non-operating income - net		-	(16)	(20)	(30)	(18)	(21)
Income before income taxes (IBT)		5	(4)	30	(1)	(11)	6
Extraordinary items		-	-	-	-	-	-
Provision for income taxes		5	6	22	10	2	9
Net income (NI)		-	(10)	8	(11)	(13)	(3)
Dividends		1	1	-	1	-	-
Ratios							
Operating margin (OI/OR)	(%)	3.2	5.6	16.7	9.2	2.0	7.4
Profit margin (IBT/OR)	(%)	3.2	(1.9)	10.0	(.3)	(3.2)	1.6
Net income margin (NI/OR)	(%)	-	(4.7)	2.7	(3.5)	(3.8)	(.8)
RETURNS	($M)						
Interest expense (IE)		11	22	22	24	26	21
Average equity (AE)		10	4	2	1	(12)	(20)
Average long term debt (ALTD)		126	222	218	231	243	220
Ratios							
Return on equity (NI/AE)	(%)	-	(250)	400	(1 100)	*	*
Return on investment ((NI+IE)/(AE+ALTD))	(%)	8.1	5.3	13.6	5.6	5.6	9.0
Investment turnover		1.14	.95	1.36	1.36	1.50	1.83
Interest on long term debt/operating revenue	(%)	7.1	10.2	7.4	7.6	7.5	5.8
BALANCE SHEET	($M)						
ASSETS							
Current assets		55	60	96	78	57	71
Net book value[2]		233	251	249	312	284	267
Other assets		2	2	2	6	8	5
Total assets		290	313	347	396	349	343
LIABILITIES							
Current liabilities (excl. current portion of LTD)		49	60	94	93	87	90
Long term debt (incl. current portion of LTD)		213	230	205	257	228	212
Other liabilities (incl. deferred taxes)		18	24	42	51	53	63
Equity		10	(1)	6	(5)	(19)	(22)
Ratios							
NBV/Total assets	(%)	80	80	72	79	81	78
LTD/Capital	(%)	96	100	97	102	109	112
Excess (shortfall) of cash	($M)						
Current assets - Current liabilities		6	-	2	(15)	(30)	(19)

1 Wherever possible, values for 1979-1983 were taken from Wardair's 1983 5 year summary and 1978 values from Wardair's 1982 5 year summary.

2 Total property at cost including progress payments less accumulated depreciation.

* Wardair's negative equity in these years leads to meaningless results.

Source: Wardair International Annual Reports, 1978-1983.

ANNEX A

Capacity Measures: Developments in Methodology

Weight Limited vs. Volume Limited Payload Tons
Maximum Seat Miles

Table 1	Level I Airlines: Selected Jet Airplanes (1978-1983)
Table 2.1	Payload Ton Miles vs. Available Ton Miles (1982)
Table 2.2	Maximum Seat Miles vs. Available Seat Miles (1982)
Figure 1	Capacity: Payload Tons - Passenger and Cargo
Figure 2	Cargo's Percentage of Total Capacity vs. Seating Density
Figure 3	Maximum Ranges Associated with Weight and Volume Limited Payload

ANNEX A

CAPACITY MEASURES: DEVELOPMENTS IN METHODOLOGY

Introduction

In order to preserve the linkage with the CTC 1982 Equipment and Fleet Planning report's capacity evaluation, weight limited payload tons remain the primary measure of capacity offered. However, through further analysis of data regarding the aircraft types' configuration by Research Branch and Aviation Planning Associates[1] personnel, a 'volume limited' payload ton capacity was developed. A comparison of the two measures is provided below. In addition, maximum seat miles (MSM), another newly formed measure, is highlighted.

Weight Limited vs. Volume Limited Payload Tons

Maximum weight limited payload tons represent the total load carrying capacity (passenger plus cargo) of an aircraft type, calculated by subtracting the aircraft's operating weight empty from its maximum zero fuel weight.[2] The calculation of volume limited payload tons involves separate estimates in respect of cargo and passengers, which are then summed to arrive at the overall measure.

The cargo volume limited payload of an aircraft is estimated by multiplying the volume available for cargo in the belly, (less the space reserved for passenger baggage) by an assumed value of 10 lbs./cu. ft. The passenger payload estimate is based on the maximum number of seats calculated under the assumption that the configuration is all economy with a 32" pitch seating. The number of seats are then multiplied by 210 pounds, the assumed average weight of a passenger with baggage. The sum of the two components (cargo and passenger) establishes the volume limited payload tons of a particular aircraft.

The relationship between the two measures is shown in Table 1 and is illustrated in Figure 1. In all but one instance (the B727-200), the value for volume limited payload tons is below that of weight limited payload tons. The implication of this relationship is an over statement of operating capacity when weight limited payload is used. Except for the B727-200 where the ratio is one to one, the size of volume to weight limited capacity ranges from .80 to .97. The smaller volume limited payloads tend to increase maximum attainable ranges from the ranges reported in the CTC 1982 Equipment

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[1] Analysis of Elements of Direct Operating Costs of Canadian Air Carrier Jet Aircraft, Research Branch, CTC, April 28, 1983.

[2] For detailed calculations by aircraft type refer to Equipment and Fleet Planning in the Canadian Airline Industry, Research Branch, CTC, August 1982, WP No. 10-82-05, Appendix Tables B.1.1-B.1.4.

and Fleet Planning report which used weight limited tons as its measure of capacity.

It should be noted that due to variations in methodology there are some differences between the above CTC 1982 report and this table regarding the maximum number of seats and the range of certain aircraft types. The CTC 1982 Equipment and Fleet Planning report used the number of seats recorded in 'Jane's All the World Aircraft' which essentially represents aircraft specifications provided by the manufacturers. Maximum seating capacity shown in Table 1 was determined as far as possible, to reflect the design characteristics of each aircraft type. A number of factors such as cabin dimensions, floor layout, location of galleys and washroom facilities, and emergency exit provisions were considered in establishing a comparable seating configuration for individual aircraft types, with an assumed all-economy seating pitch of 32".

An interesting relationship of the percentage of cargo to volume limited payload tons, and the maximum number of available seats per volume limited payload ton is illustrated in Figure 2. All aircraft types considered have clustered around the plotted straight line, however, they appear to fall into two groups. The four large, long-range aircraft have a high percentage of cargo capacity to total, ranging from 25% to 32%. On the other hand, they have the lowest ratio of seats to volume limited payload tons. In contrast, the other aicraft types which are characterized as having either a short or a medium range, have a higher seating density. Their percentages of cargo capacity to total are below 20%. These relationships are logically explainable by the volume/area (floor) ratio differences between wide body and narrow body aircraft.

Maximum, theoretical ranges of the aircraft types using each of the two payload measures is shown in a bar chart form in Figure 3. In all but two cases, when volume limited is used in place of weight limited capacity in the calculation of the range, a longer distance is attainable. The two exceptions are the DC9-30 and the DC10-10. Estimates for the range of DC9-30 reflect different assumptions as to the configuration of the aircraft, reflected by the maximum take-off weights. The maximum take-off weight for DC9-30 used in the CTC 1982 Equipment and Fleet Planning report is 12% higher than the take-off weight used in the calculation of volume limited capacity and range. The lower take-off weight is a result of using Air Canada's current operating configuration as opposed to the maximum attainable take-off weight. The latter of the two aircraft types was not included in the above CTC 1982 report and therefore no comparison is made. It is worth noting that the change in measures have a varying effect among the aircraft types. In general, the longer ranged aircraft have substantially increased their ranges.

Maximum Seat Miles (MSM)

A standard measure of capacity used by the airlines is available seat miles (ASM), which represents passenger capacity. However, no one source provides consistent and reliable data on ASM for all of the airlines. Thus, it was essential to develop a measure of available capacity which could be applied on a uniform basis to each airline's operations and thus enable

meaningful comparisons. Such a measure is maximum seat miles (MSM). MSM are derived at by multiplying the miles flown by aircraft type, by that aircraft's maximum number of seats, which is indicated in column six of Table 1.

The capacity measures described above were related to measures provided in the four major airlines 1982 annual reports. Table 2.1 and Table 2.2 show relevant comparisons.

TABLE 1

LEVEL I AIRLINES: SELECTED JET AIRPLANES (1978-1983)

	Weight Limited Tons (1)	Volume Limited Tons (2)	Vol. Ltd./ Wt. Ltd. (3) = 2÷1	Cargo Vol. Ltd. Tons (4)	% of Cargo to Vol. Ltd. (5) = 4÷2	Maximum Available Seats (6)	Seats per Vol. Ltd. (7) = 6÷2	Maximum Range Miles (Vol. Ltd.)	Maximum Range Miles (Wt. Ltd.)
WIDE BODY									
LONG RANGE									
B 747 - 200	82.5	66.1	.80	17.0	25.7	468	7.1	5 860	4 890
DC 10 - 30	52.0	46.6	.90	15.0	32.2	301	6.5	6 530	4 470
L 1011 - 500	48.5	38.8	.80	10.3	26.5	271	7.0	5 490	3 490
MEDIUM RANGE									
DC 10 - 10	45.0	40.9	.91	7.3	17.8	320	7.8	3 860	not incl.
L 1011 - 100	43.0	41.9	.97	8.3	19.8	320	7.6	3 280	2 750
LARGE JETS									
LONG RANGE									
DC 8 - 63	34.0	30.4	.89	7.7	25.3	216	7.1	4 390	4 120
MEDIUM RANGE									
B 767 - 200	34.0	29.0	.85	5.3	18.3	225	7.8	3 130	2 040
B 727 - 200	20.0	20.3	1.01	3.9	19.2	156	7.7	2 440	2 140
OTHER JETS									
SHORT RANGE									
B 737 - 200	16.0	13.7	.86	1.8	13.1	113	8.2	1 550	1 290
DC 9 - 30	14.0	12.9	.92	2.2	17.1	102	7.9	1 230	1 470

Table 2.1

PAYLOAD TON MILES VS. AVAILABLE TON MILES (1982)

	AIR CANADA SYSTEM TOTAL	CP AIR SYSTEM TOTAL	PWA SCHEDULED SERVICES	WARDAIR CHARTER SERVICES
(Max.) Payload Ton Miles (Weight Ltd.)	3 863	1 774	257	948
(Max.) Payload Ton Miles (Volume Ltd.)	3 499	1 522	220	784
Available Ton Miles (ATM)	3 541	1 498	**	**
MPTM (Weight Ltd.)/MPTM (Volume Ltd.)	1.10	1.17	1.17	1.21
MPTM (Volume Ltd.)/ATM	.99	1.02	**	**
Average Stage Length (Miles)	770	931	249	1 990

MPTM - Maximum Payload Ton Miles

** Not Available

Sources: (1) Airlines' Annual Report, 1982.
(2) Aviation Statistics Centre - Statement 3 - Unit Toll Services and Statement 4 - Charter and Contract Flying Services.

Table 2.2

MAXIMUM SEAT MILES VS. AVAILABLE SEAT MILES (1982)

	AIR CANADA SYSTEM TOTAL	CP AIR SCHEDULED SERVICES	PWA SCHEDULED SERVICES	WARDAIR CHARTER SERVICES
Maximum Seat Miles (MSM)	24 263	9 296	1 811	5 353
Available Seat Miles (ASM)	21 524	8 447	1 761	5 290 (e)
MSM/ASM	1.13	1.10	1.03	1.01
Average Passenger Trip (Miles)	1 175	1 712	296	2 780

(e) Estimated

Sources: (1) Airlines' Annual Report, 1982.
(2) Aviation Statistics Centre - Statement 3 - Unit Toll Services and Statement 4 - Charter and Contract Flying Services.

FIGURE 1

CAPACITY: PAYLOAD TONS - PASSENGER AND CARGO

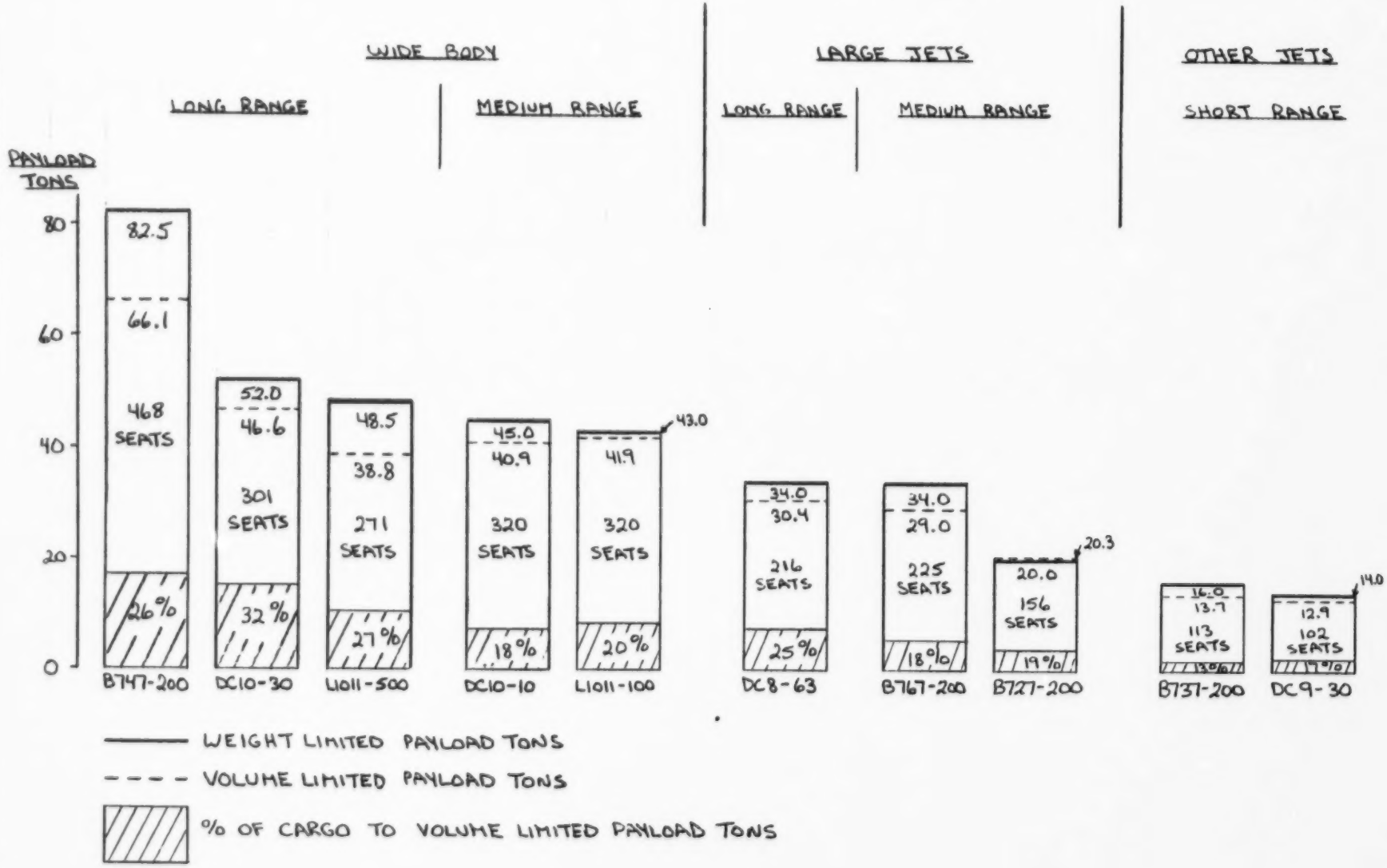

FIGURE 2

CARGO'S PERCENTAGE OF TOTAL CAPACITY VS. SEATING DENSITY

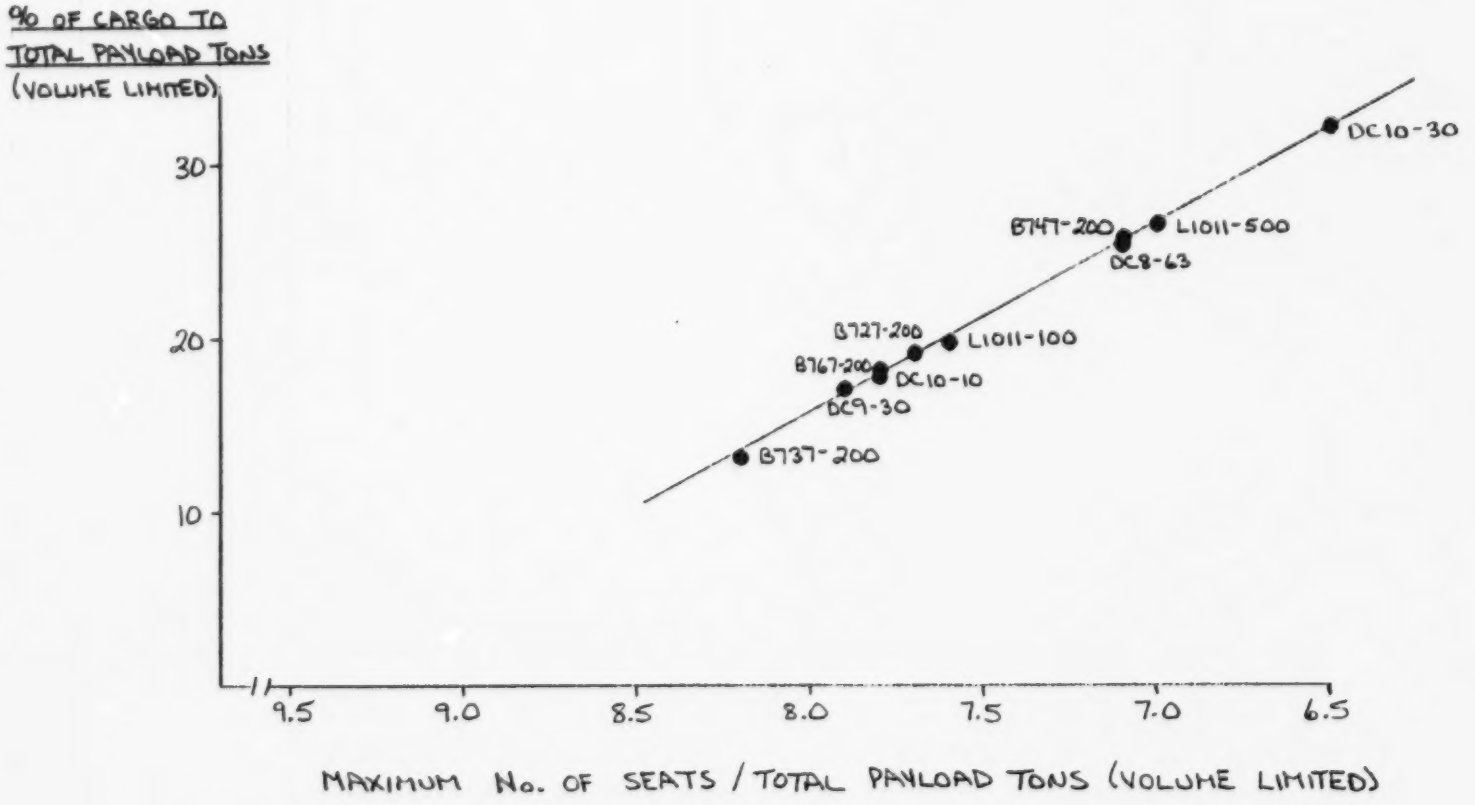

FIGURE 3

MAXIMUM RANGES ASSOCIATED WITH WEIGHT AND VOLUME LIMITED PAYLOAD